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PREGNANCY AND LACTATION CHANGES IN FIBRO-ADENOMA OF THE BREAST*

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(WITH SPECIAL PLATE)

The fibro-adenoma is the most common tumour of the breast occurring in young women in the child-bearing period. The firm character of the lesion, the definite encapsulation, and the slow growth over a period of years make the clinical diagnosis relatively easy. The rapid growth of fibro-adenoma during pregnancy and the cystic enlargement during lactation are less well-known features. These and the variety of microscopical changes which may be observed when the tumours respond to the hormonal influences of pregnancy and lactation may lead to some difficulties in diagnosis, and as a result mutilating operations may be performed needlessly.

Moran (1935) reviewed the literature on fibro-adenomas of the breast excised during pregnancy or lactation and the cases recorded to that date in the surgical pathological laboratory of the Johns Hopkins Hospital. He was able to find records in the literature of only nineteen cases verified by microscopical examination. The outstanding clinical features of the cases reviewed by this author were the definite enlargement of the growth during pregnancy or lactation, the history of the patient's awareness of the tumour for a period of two or more years before pregnancy, and the absence of changes in the overlying skin, in the nipple, or in the axilla during the period of rapid growth. Moran concluded that the changes produced in these growths by pregnancy and lactation were like those occurring simultaneously in the surrounding normal breast tissue and bore no relation to malignancy. He recommended that the growths be removed during pregnancy rather than during lactation if discovered in time, since the tumour before lactation is smaller, is less vascular, and is free from marked secretory activity.

The present study is based upon thirteen cases of fibro-adenomas removed during pregnancy, ten excised during lactation, and ten operated upon at varying intervals after the cessation of lactation. Every phase of pregnancy, lactation, and post-lactation involution is represented in this series. The study of the specimens permits a comparison of the microscopical changes in these tumours with those occurring simultaneously in the surrounding breast tissue. It likewise affords an opportunity for correlation of these changes with those produced experimentally in the breast of humans and other mammals by the injection of the various sex hormones.

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Pregnancy Changes in Fibro-adenomas and in Normal Mammary Tissue

In the thirteen cases of fibro-adenomas removed during pregnancy all but one gave a history of rapid enlargement. In the case in which the patient had been unaware of any increase in size of the lesion the tumour was removed in the fourth month of pregnancy, but microscopically evidence of recent growth and of pregnancy was found. The tumour removed earliest in the course of gestation was excised in the fifth week. The nodule had doubled its size within four weeks. Two in which rapid enlargement was noted were removed in the sixth week and one at the end of the second month respectively. Nine out of thirteen were removed before the end of the first half of pregnancy (Table I). This corresponds to the period of maximum growth in the pregnancy breast normally, which occurs between the end of the first and beginning of the fourth month. In the remaining cases the tumours were removed in the fifth, sixth, seventh, and at the beginning of the eighth month.

TABLE I.—*Fibro-adenoma in Pregnancy*

Case	Age Race	Duration	Symptoms	Size	Site	Month of Pregnancy	Treatment	Microscopic	Result
				cm.					
1	W 25	2 y.	Lump	1	UOQ*	5 wks.	Excision	Fibromatous	Well 9 m.
2	W 32	2 y.	,,	1	UOQ	6 wks.	,,	,,	,, 7 y.
3	W 29	3 m.	,,	1.5	UIQ	2nd	,,	Fibromatous Schimmelbusch	,, 10 y.
4	W 20	3 w.	,,	—	—	3rd		Fibromatous	Lost
5	W 24	2 m.	Lump Pain	3	UOQ	3rd	,,	Myxomatous	Well 3 y.
6	W 23	2 m.	,,	1	LOQ	3rd	,,	Fibromatous	Lost
7	W 28	18 m.	,,	2.5	—	3rd	,,	Myxomatous	Well 4 y.
8	W 26	6 m.	Lump	3	—	4th	,,	,,	Lost
9	W 19	6 m.	,,	3	UIQ	4th	,,	,,	Well 6 y.
10	W 29	2 y.	,,	3	LOQ	5th	,,	Carcinomatous	Dead 3½ y. later
11	W	—	,,	2.5	—	6th+	,,	Fibromatous	Well 11 y.
12	W 31	3 m.	,,	3	UIQ	7th	,,	,,	,, 1 y.
13	W 22	2 m.	Lumps (2)	9	LOQ	8th	Amputation	,,	,, 6 m.

* UOQ = Upper Outer Quadrant; UIQ = Upper Inner Quadrant; LOQ = Lower Outer Quadrant.

The consistency of the tumours removed ranges from hard to rubbery firmness, and they were all freely movable without retraction of the nipple or dimpling of the skin. No enlargement of the axillary lymph nodes could be made out. In two instances (tumours removed at four and seven months) two tumours were found in the breast at operation. All the growths were apparently encapsulated. In spite of this and the absence of clinical signs of malignancy on inspection and palpation, malignancy was often suspected because of the rapid growth of the lesion and the firm nodular character. In the gross, six tumours showed macroscopic pregnancy changes. Five were observed to be granular on section, and one removed at the onset of the eighth month was soft and red (Plate, Fig. 1). Microscopically, marked epithelial proliferation, non-encapsulation at one or more points, with invasion of fat and many mitotic figures, were observed in the tumours removed during the first half of pregnancy. In these cases the infiltrating epithelium with mitotic figures may easily be mistaken for cancer by one unfamiliar with such pregnancy changes. In one instance cancer developed, and death from hepatic metastases occurred.

In general the microscopical changes occurring in fibro-adenomas during pregnancy correspond to those occurring in the surrounding normal breast tissue. The changes in the tumour, however, are more irregular—most pronounced at the margins—and there is a tendency for the tumour at first to exceed and later to lag behind the physiological development in the surrounding mammary tissue. Tumours of long standing with a considerable amount of hyalinization of the connective tissue may remain refractory to pregnancy changes, and those which have responded to a previous pregnancy may remain unchanged during subsequent gestations. Multiple fibro-adenomas in the same breast may show varying degrees of response. McFarland (1922) has reported a case in which the patient had three fibro-adenomas in the same breast removed during pregnancy. The largest tumour showed marked response, the medium-sized tumour showed some change, but practically no hypertrophy was observed in the smallest nodule.

FIRST THIRD OF PREGNANCY

The changes occurring in the first third of pregnancy are represented by seven tumours, one removed at the end of the first month, one at six weeks, another at the end of two months, and the remainder at the end of three months. The specimen removed earliest in pregnancy was a small fibro-adenoma excised at the end of the fifth week. The history of this case is given below.

Case 1.—The patient is a married woman aged 25. A small nodule had been present in the left breast for two years. At the first examination, October 1, 1936, a pea-sized nodule was palpated by her physician. On the second examination, one month later, the mass was twice this size and very painful. The lesion was excised on November 2, 1936. The diagnosis of cystic mastitis was made, pregnancy not having been suspected. The tissue and patient were then referred to us in order to rule out the possibility of malignancy and to investigate the cause of digestive upsets. From the tissue excised, and from the tense swollen aspect of the breast, a diagnosis of fibro-adenoma in pregnancy was made. The patient had missed one menstrual period. An Aschheim-Zondek test performed on December 1, 1936, was positive, and the baby was born on June 23, 1937. The nodule therefore was excised at the end of the fifth week of pregnancy. In the gross and microscopically the tumour was not encapsulated. It consisted of small branching tubules of rapidly dividing epithelium and proliferating fibroblasts. Lymphocytes were mingled with the fibroblasts.

The changes observed in this tumour and in those removed later in the first third of pregnancy are characterized by a progressively increasing, branching, and re-duplicating of small terminal tubules (Figs. 2A and 2B), and a proliferation of young connective tissue about them. Some of these tubules extend into the adjacent neighbouring fat. The epithelium lining the ducts consists of small oval cells with scanty cytoplasm and dense nuclei, many of which are undergoing mitosis. In places these proliferating cells are without basement membrane, obliterate the lumen of the ducts, and grow into the ends of the adjoining ducts to form small duct adenomas. The fibroblasts surrounding the tubules show active growth, and are interspersed with numerous lymphocytes. The number of budding tubules and the amounts of periductal connective tissue increase steadily until mid-pregnancy. The lymphocytic infiltration is greatest at the end of the second month, and diminishes in mid-pregnancy.

Microscopically all but one of the fibro-adenomas were non-encapsulated, showing irregular extension into the surrounding mammary parenchyma and fat. In the exception the tumour removed in the third month of pregnancy was definitely encapsulated and the stroma showed advanced myxomatous change. This tumour had remained relatively refractory to the changes of pregnancy. It measured 2½ cm. in diameter, and had been first noted a year and a half previously, at the age of 27. It showed a moderate increase in the number of newly formed epithelial ramifications, and the pre-existing myxomatous stroma of the tumour was sprinkled with lymphocytes.

A comparison of changes in the fibro-adenoma with those in the surrounding breast tissue shows greater epithelial proliferation in the tubules and more rapid growth in the surrounding connective tissue in the fibro-adenoma. The lobules of the adjacent breast tissue are more heavily infiltrated by lymphocytes, and a larger number of terminal tubules remain patent, and are lined by only two or three rows of epithelium.

MID-THIRD OF PREGNANCY

The changes in the mid-third of pregnancy are represented by two tumours removed during the fourth month and one during the fifth month. The changes in the breast tissue during this period are transitional between those of the first and the last third. The newly formed tubules are grouped together in large lobules; the surrounding connective tissue is reduced in amount and is gradually crowded out. Lymphocytic infiltration is absent. The lumen of a few of the tubules shows dilatation, and occasional secretory vacuoles form in their lining cells. One of the fibro-adenomas removed in this stage was encapsulated and apparently quiescent. In another the growth of fibrous tissue continued, and in the third tumour there was progressive proliferation of both epithelium and connective tissue. In this case (reported below) malignant change occurred.

Case 10.—The patient was a white female aged 29 who had noticed a small lump in the breast two years previously. A surgeon who saw the lump eighteen months previously advised excision. On examination, May 23, 1931, a small nodule about the size of a 10-cent piece was palpated in the right breast in the mid-portion of the lower hemisphere. An indefinite swelling was felt in the upper hemisphere. Another small tumour was palpated above the nipple in the left breast. Both breasts were indefinitely lumpy to palpation. A diagnosis of lumpy painful breasts was made by Dr. Bloodgood; no operation was advised, and the patient was asked to return at monthly intervals. One month later re-examination showed no definite lump in the lower portion of the right breast, but a lump was still palpable in the upper

portion, as well as one near the nipple of the left breast. When examined in January, 1932, the lump in the upper portion of the right breast had definitely increased in size, and the tumour in the left breast had disappeared. The patient at this time was five and a half months pregnant. An excision of the tumour in the right breast was performed on January 5, 1932. The breast was vascular and the tumour was not encapsulated. Dr. Bloodgood made the note that "it cuts and scrapes like cancer, and on frozen section the cells are morphologically cancer," but it was decided not to do the complete operation because the changes were attributed to pregnancy rather than to malignancy. In February, 1932, post-operative irradiation was given because of the resemblance of the tumour to malignancy (Figs. 3, 4A, and 4B). In June, 1933, both breasts seemed normal on palpation, and there was no induration of the scar in the right breast. Soon after this examination the patient again became pregnant. Towards the end of the second pregnancy two small tumours appeared in the region of the scar, but following the birth of the second child in February, 1934, one of them disappeared. In March, 1935, three years after the first operation, one small nodule remained in the region of the scar. This lump was stationary in size, and there was no enlargement of the axillary nodes. The patient complained of indigestion and the liver was enlarged. In October, 1935, the patient died with metastases to the liver, three years and ten months following the operation. No metastases were ever felt in the axillary nodes.

LAST THIRD OF PREGNANCY

The changes occurring in the last third of pregnancy are represented by three tumours, one removed during the sixth month, another during the seventh month, and the last at the beginning of the eighth month. In the surrounding breast tissue removed with these tumours the characteristic changes of late pregnancy are observed. The reduplicated terminal tubules are grouped into large lobules. Most of the periductal fibroblasts have disappeared and are replaced by capillaries engorged with red blood cells. The terminal tubules are dilated into acini, and many are lined by a single row of low cuboidal cells with secretion vacuoles. A few small nests of proliferating epithelial cells may still be seen, and also an occasional duct plugged with epithelial cells. Some acini are greatly dilated, suggesting the beginning of lactation.

The fibro-adenomatous tissue in this period presents interesting irregularities. Some of the tumour tissue shows changes similar to those in the surrounding breast tissue, which contains large pre-lactating lobules. Other portions show the clusters of small tubules surrounded by large amounts of periductal connective tissue as seen in the fibro-adenomas removed early in pregnancy, while in occasional areas pronounced epithelial proliferation with the formation of duct adenomas is found. In the fibro-adenoma removed just before the eighth month the changes of later pregnancy were observed at the periphery of the tumour, but only moderately increased growth of the connective tissue and of duct epithelium was noted in the central portions. The history and findings in this case are given below.

Case 13.—The patient is a white woman aged 22 who about six weeks after the onset of gestation noticed two small swellings in the lower half of the right breast, each slightly

LEGENDS FOR THE SPECIAL PLATE

FIG. 1 (Case 13).—Bisected specimen of a fibro-adenoma removed at the beginning of the eighth month of pregnancy. The cut surface is fleshy and red in appearance. The tumour had not been noted before the beginning of pregnancy. Between the sixth week of gestation and the time of its removal the tumour had grown from a pea-sized nodule to a mass 9 cm. in diameter. The microscopical appearance of the tumour is shown in Figs. 5A and 5B.

FIGS. 2A and 2B (Case 3).—Photomicrographs comparing A, normal breast tissue in the third month of pregnancy, with B, a growing fibro-adenoma removed from the same breast. The normal tissue (A) shows ramifying tubules surrounded by young connective tissue and numerous lymphocytes. A similar growth of tubules and connective tissue is seen in the tumour (B). The tumour tissue, however, shows a more marked proliferation of epithelium, some of which is forming small duct adenomas.

FIG. 3 (Case 10).—Gross specimen of a rapidly growing fibro-adenoma removed in the fifth month of pregnancy from a woman aged 29. The mass was not encapsulated, and on section cut like cancer.

FIGS. 4A and 4B (Case 10).—Photomicrographs comparing A, normal breast tissue, with B, rapidly growing fibro-adenoma, both from the case shown in Fig. 3. The lobules of normal mammary tissue (A) contain large numbers of recently formed tubules. In some the remains of epithelial proliferation are seen. Others are dilated to form acini, which do not yet show secretory changes. The tumour tissue (B) shows proliferating masses of epithelium at the end of the mammary tubules. Under high power many of these cells have a malignant morphology. The epithelium is surrounded by rapidly growing connective tissue. The epithelium of the tumour invaded the surrounding fat. The patient died with metastases to the liver three years and ten months following the excision.

FIGS. 5A and 5B (Case 13).—Photomicrographs of tissue obtained from the tumour shown in Fig. 1. The tumour was removed at the beginning of the eighth month of pregnancy. At A is shown the tendency for lobule formation with small cysts at the margin of the tumour and the absence of pregnancy changes in the more central portions; B shows another portion of the tumour in which the mammary lobules are in the pre-lactation state. The lobules are separated by large amounts of fibrous tissue.

FIG. 6 (Case 14).—Photomicrograph of a fibro-adenoma removed during the sixth week of lactation. The fibro-adenoma at the bottom shows lactation changes. The lobules, however, contain a more dense supporting stroma and their acini are widely dilated. The normal lactating lobules in the surrounding breast tissue are shown above.

FIG. 7 (Case 17).—Gross specimen of a fibro-adenoma removed in the third month of lactation from a coloured girl aged 17. Milk exuded from the cut surface about the margins of the tumour.

FIGS. 8A and 8B (Case 17).—Photomicrographs comparing A, normal lactating breast, with B, quiescent fibro-adenomatous tissue removed from the same patient. The gross specimen is illustrated in Fig. 7. At A is shown the normal lactating mammary tissue: B shows the quiescent lobules of the central portions of the fibro-adenoma surrounded by dense hyalinized connective tissue.

FIG. 9 (Case 15).—Photomicrograph showing subinvolution in a lactating fibro-adenoma. The tumour was excised from a coloured female, aged 36, who had had two pregnancies in successive years. She had been nursing the second child for six weeks at the time of excision. At A are shown the lactating lobules: at B are seen the fibro-adenomatous areas which have failed to lactate but are instead undergoing cystic change.

FIGS. 10A and 10B (Case 20).—Gross specimen of a fibro-adenoma removed following nine months of lactation in a woman aged 34. The tumour grew rapidly in the first half of pregnancy and enlarged slowly thereafter. Its cut surface (10B) had the appearance of sarcoma.

FIG. 11.—Photomicrograph of the tissue removed from the margin of the tumour shown in Figs. 10A and 10B. Both the connective tissue and the epithelium show marked proliferation and resemble malignancy.

FIG. 12.—Whole mount of a female rat breast. The rat was castrated at 21 days and injected with 100 rat units (1,000 international units) of oestrone daily for 20 days thereafter. The dense epithelial buds seen on the ramifying tubules are the result of overstimulation with oestrone and do not occur if the rat is injected with doses up to 20 rat units daily for this period.

FIG. 13.—Photomicrograph of a female rat breast treated with 50 rat units of oestrone daily for 100 days following castration on the 32nd day. The dilated mammary tubules showed the remains of secretory activity and are lined by irregular epithelium, some of which is proliferating but most of which is atrophic. The outstanding feature is the amount of periductal connective tissue seen in the upper portion of the picture.

larger than a pea. They increased rapidly in size in the next few weeks. By the fifth month of pregnancy they were as large as an orange, and the overlying skin became red and the veins enlarged. An attempt was made to drain this mass elsewhere, but no pus could be obtained. Examination revealed enlarged pendulous breasts, the right breast being nearly twice the size of the left. A mass approximately 9 cm. in diameter occupied the lower portion of the right breast. It was firm, freely movable, definitely encapsulated, and lobulated. Several drops of colostrum could be expressed from both nipples. The calculated duration of the pregnancy was slightly under eight months. Because of the size of the tumour a simple mastectomy was done on August 16, 1937. The tumour tissue was soft, fleshy, and red in the gross. Practically no secretion could be demonstrated. Microscopical study showed a typical fibro-adenoma with compressed epithelial channels. At the termination of these epithelial channels there were areas of hyperplasia. At the margins of the tumour irregular pregnancy changes were seen, corresponding to those in the surrounding breast tissue (Figs. 5A and 5B).

Changes During Lactation

The changes occurring in fibro-adenomas during lactation are represented by ten tumours, two of which were removed in the sixth week of lactation, three in the third month, one in the fifth month, and the remaining four towards the end of lactation, from the ninth through the twelfth month. As in pregnancy, changes similar to those in the surrounding breast tissue occur in parts of the tumour. However, with the exception of lobules scattered about the periphery the tumour tissue fails to respond to lactation. It shows a definite tendency to undergo involutional changes, the most characteristic features being hyalinization and myxomatous degeneration of the stroma. In some cases the rapid growth of connective tissue seen during pregnancy is continued into lactation. In the occasional lobules which show lactation changes the acini are more widely dilated than in the normal lactating breast, and the fibrous tissue in the dividing septa and in the papillary epithelial projections within the acini is greater in amount. Thus the lactating lobules within the fibro-adenoma are coarser in structure (Fig. 6). In the cases reviewed in this series there was apparently a greater tendency for lactation effects to appear in the fibro-adenoma in early lactation than in later lactation. The variety and irregularity of changes are greater in lactating fibro-adenomas than in those excised during pregnancy, because those occurring in pregnancy tend to persist and to have superimposed upon them, in isolated lobules, lactation changes. In the case detailed below the tumour was excised in the third month of lactation. As shown in Figs. 7, 8A, and 8B, the breast was the seat of typical lactation changes. The tumour for the most part remained quiescent, but irregular lactating lobules were scattered about the periphery. The outstanding effect was on the stroma of the tumour, which showed marked hyalinization.

Case 17.—The patient was a coloured girl, aged 17, who noticed a lump in her right breast two years previously. At this time it was about the size of a walnut. During the next year the tumour doubled in size, and thereafter remained stationary. The patient became pregnant in September, 1936. Soon after missing her first period she noted a rapid increase in the size of the tumour, which also became increasingly tender and painful. On examination both breasts were enlarged beyond the normal. The right breast was twice the size of the left and reached to the level of the umbilicus. A slight amount of serous discharge could be expressed from the left nipple. A nodular mass 17 cm. in diameter occupied the lower and central portion of the right breast. No enlarged nodes could be palpated in either axilla. The calculated duration of the pregnancy was five and a half months. It was decided to postpone operation until after delivery. Caesarean section was performed on May 20, 1937, and the mass in the breast was removed on August 26 in the third month of lactation. The tumour in the gross was fleshy but definitely encapsulated. The cut surface was soft and bulging and exuded milk. Microscopical examination showed typical lactation changes in the normal breast tissue. The central portion of the tumour did not respond to lactation, but the periphery showed numerous secreting acini, many of which were cystic in appearance. The fibrous stroma was of the adult hyalinized variety, and some of the epithelium-lined channels showed the remains of proliferating activity while others showed atrophic changes.

In three of the tumours excised during lactation unusual effects were observed. In one (Case 15) the tumour, which had appeared two years previously, was excised from a coloured female aged 36. There had been two pregnancies within the two years preceding operation. She had been nursing the second child for six weeks at the time of excision. The breast tissue showed characteristic lactation changes. In the tumour there were large cysts (Fig. 9). These were surrounded by areas of residual fibro-adenoma in which could be observed epithelial proliferation characteristic of the first half of pregnancy and some atypical lactating acini.

In the two remaining cases the unusual effects were presented by the stroma of the tumour, which resembled that of sarcoma.

A white woman, aged 34 (Case 20), had noticed a tumour fourteen months previously. The breasts were first examined following rapid growth of the mass during the fifth month of pregnancy. An encapsulated nodular tumour was found which occupied the entire upper half of the left breast. With the onset of lactation the tumour ceased to grow. Following nine months of lactation the patient presented herself for examination in this clinic. At this time the tumour occupied practically the entire breast and was 16 cm. in diameter. The superficial veins were dilated and milk could be expressed from the nipple. The breast was amputated on September 27, 1927. On gross examination the appearance suggested sarcoma (Figs. 10A and 10B). On microscopical examination (Fig. 11) there was an extreme cellularity in the fibrous tissue, which showed many mitotic figures. This was most marked at the margins of the tumour, and in these areas the epithelium of the terminal tubules looked malignant. The patient was reported well eight years after operation.

A tumour (Case 18) was removed from a woman aged 49, who had observed a tumour of the left breast in the third month of lactation. It had been painful and tender for eleven months. The tumour occupied nearly the entire

TABLE II.—*Fibro-adenoma in Lactation*

Case	Age Race	Duration	Symptoms	Size	Site	Months of Lactation	Treatment	Microscopic	Result
				cm.					
14	W	—	Lump	—	—	6th wk.	Excision	Fibromatous	Lost
15	C 36	2 y.	,,	5	—	,,	,,	,,	Well
16	W 23	15 m.	Lump Pain	5	LOQ*	3	,,	,,	Lost
17	C 17	2 y.	Lump	17	LOQ	3	Amputation	,,	Well
18	W 49	11 m.	,,	15	UOQ	3	,,	,,	,, 25 y.
19	W 30	—	,,	1	—	5	Excision	Myxomatous	Lost
20	W 34	14 m.	,,	16	—	10	Amputation	,,	Well 8 y.
21	W 34	10 m.	Lump Pain	2	UOQ	10	Excision	Fibromatous	,, 25 y.
22	W 22	—	Lump	1.5	UOQ	End of lact.	,,	Myxomatous	Lost
23	W 29	30 m.	,,	2.5	UIQ	,,	,,	Fibromatous	Well 11y.

* LOQ = Lower Outer Quadrant; UOQ = Upper Outer Quadrant; UIQ = Upper Inner Quadrant.

left breast, and an amputation was performed, April 9, 1898. The stroma was unusually cellular, and was differentiated with difficulty from sarcoma. The patient was reported well twenty-five years later.

Post-lactation Changes

Ten tumours excised at known intervals after lactation were chosen for study of the involutional changes. In four cases the tumour was excised within five months to a year after lactation, a fifth was excised at the end of fifteen months, and the remainder between two and eight years after the cessation of lactation. In three cases the tumour had been present in more than one pregnancy. The outstanding microscopical feature in these cases was the replacement by myxomatous and hyalinized connective tissue of the more cellular stroma found during pregnancy and occasionally persisting in lactation. Seven of the ten cases studied showed myxomatous changes. In one of the tumours removed two months after the cessation of lactation residual lactation was found as well as in the surrounding breast tissue. Less striking areas of residual lactation were seen in four of the other tumours. In several growths removed two or more years after the end of the nursing period strands of atypical proliferating epithelium were found at the margin of the tumour. In the majority, however, involutional changes such as occur in the normal breast were found. The epithelial tubules had collapsed, secretion was diminished or absent, and the lining cells had atrophied and were reduced to a single layer of quiescent epithelium. In one case in which the tumour was excised eight years after nursing an intermittent milky discharge from the nipple occurred. The excised fibro-adenoma was found to contain multiple cystic areas, some of which suggested residual lactation acini.

TABLE III.—*Fibro-adenomas in Post-lactation*

Case	Age Race	Duration	Symptoms	Size	Site	Relation to End of Lactation	Treatment	Microscopic	Result
				cm.					
24	W 30	1 m.	Lump	—	—	5 m. after	Excision	Myxomatous	Well 4 y.
25	W 40	—	,,	1.5	UOQ*	6 ,,	,,	,,	Lost
26	W 31	6 y.	,,	2.5	LIQ	8 ,,	,,	Fibromatous	,,
27	W 19	5 y.	,,	3	UOQ	12 ,,	,,	Myxomatous	,,
28	W 28	15 m.	Lump	1.5	LIQ	15 ,,	,,	,,	,,
29	W 28	3½ y.	Pain Lump	3	UOQ	2 ,,	,,	,,	Well 2 y.
30	W 37	14 y.	,,	1	UIQ	2 ,,	,,	,,	,, 10 y.
31	W 41	—	,,	—	UOQ	8 y.	,,	Cystic disease	,, 2 y.
32	W 41	—	,,	2	UOQ	8 y.	,,	,,	Lost
33	W 35	9 y.	,,	3	—	—	,,	Fibromatous	Well 5 y.

* UOQ = Upper Outer Quadrant; LIQ = Lower Inner Quadrant; UIQ = Upper Inner Quadrant.

Discussion

Recent studies indicate that the changes observed in fibro-adenomas and in the surrounding breast during pregnancy and lactation are influenced by the sex hormones. The failure of the fibro-adenomatous tissue to respond to the same extent and in the same manner as normal breast tissue to all phases of pregnancy and lactation suggests that the tumour is more sensitive to certain hormones than to others.

The growth of mammary ducts and periductal fibrous tissue in both animals and humans is stimulated by oestrin (Astwood, Geschickter, and Rausch, 1937). The histology of fibro-adenomas removed at puberty, characterized by growth of ducts and stroma without evidence of lobule formation, suggests that these neoplasms represent an increased response to oestrin on the part of the tissue involved. Oestrin, which is secreted by the ovarian follicle in increased amounts at puberty, acts as a stimulant to the growth of fibro-adenomas and accounts for their frequent appearance in patients at this period. The concentration of oestrin in the blood is again greatly increased during the first third of pregnancy (see chart). Growth of the fibro-adenoma as well as the surrounding breast results from this stimulation, and the ramification of mammary tubules and the increase in periductal fibrous tissue in both the tumour and the normal breast may be looked upon as a response to oestrin. Heiman and Krehbiel (1936) noted that oestrin in combination with anterior-pituitary-like hormones increased the number of spontaneous fibro-adenomas in rats and stimulated hyperplasia of duct and fibrous tissue in the normal breast. Since, in all but quiescent fibro-adenomas, the growth of the tumour is due to the continuous addition of newly formed tubules, response to pregnancy and lactation is to be expected in these units, which have not yet been pathologically modified through previous overstimulation. As the growth of the tumour is maximal at the periphery, the physiological changes of pregnancy and lactation are usually observed in these newly formed tubules at the periphery of the fibro-adenomas.

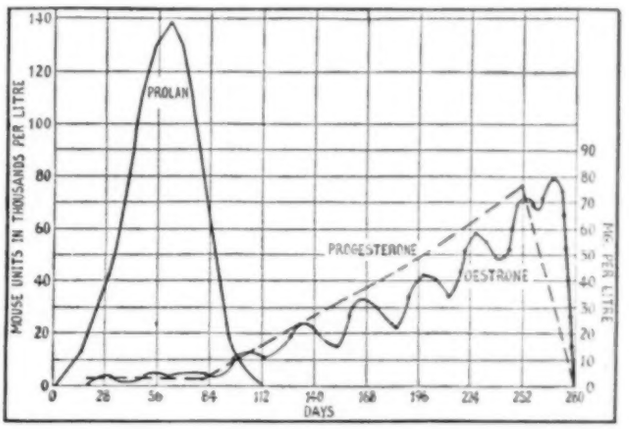

Chart showing the approximate amounts of hormones excreted in the urine during pregnancy. The curves for prolan and oestrone are in mouse units per litre, and are average values obtained from pooled samples of urine used for the commercial extraction of these hormones. The curve of progesterone shown is based upon the recovery of the excretion product of progesterone—pregnandiol. The pregnandiol values may reach 90 mg. per litre in the last month of pregnancy, according to the studies of Browne, Henry, and Venning (1937).

In recently developed fibro-adenomas or in more slowly growing tumours of longer duration oestrin stimulation in pregnancy results in marked increase in connective tissue and in pronounced epithelial proliferation. In one such case the stroma had the appearance of fibrosarcoma (Fig. 11). The atypical epithelial proliferation observed in these tumours can be reproduced in the rat breast with moderately large doses of oestrone (50 to 100 rat units daily) administered over a period of several weeks (Fig. 12). In these animals increased doses of oestrone, or moderate doses over longer periods of several months, result in cyst formation, followed ultimately by fibrosis (Fig. 13). Such cyst formation and fibrosis was observed in several tumours in this series (Cases 15 and 33).

Advanced fibrosis with hyalinization or myxomatous change in the stroma in fibro-adenoma of long standing or in tumours with an unusual intensity of oestrogenic response accounts for those fibro-adenomas which remain refractory to the hormonal influences of pregnancy and lactation. The fibrosis characteristic of these quiescent lesions is simulated experimentally by fibrosis in the mammary gland of the rat produced by overstimulation with high doses of oestrone (50 rat units daily) given over a period of 100 days (Fig. 13). The amount of fibrosis thus obtained in the rat's breast is remarkable in view of the small amount of connective tissue in this organ under normal condition.

On the basis of the above considerations oestrin stimulation, direct or indirect, may be looked upon as the most important factor in the wide variety of changes in fibro-adenomas observed during pregnancy and lactation. The multiplication of mammary tubules and periductal connective tissue seen in the first third of pregnancy is a direct effect of oestrin. These newly developed tubules in late pregnancy are acted upon by other hormones, leading to the formation of acini and development of lactation. Atypical epithelial proliferation in the mammary tumour similar to that seen in Schimmelbusch's disease or adenosis and cyst formation are pathological effects resulting from oestrogenic overdosage, and can be reproduced experimentally in the rat's breast by repeated oestrone injections. Fibrosis such as is seen in those tumours which remain quiescent is the result of prolonged and intense response to oestrin. Involution and secretion with cyst formation in these tumours may be stimulated by the lactogenic hormone of the anterior lobe of the pituitary gland. In general, the effect of the lactogenic hormone seems to hasten and make more marked involutional changes.

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The report of the Gordon Memorial College, Khartum (1936), reflects the beginning of the emergence of the Sudan from the world-wide wave of financial and economic depression. After a continuous decrease in the number of pupils, following the peak year of 1930, the turning point now appears to have been reached, and 1937 opens with 325 pupils, an increase of thirty-four over the figure of the previous year. An interesting analysis of the parentage, nationality, and provinces of origin of the pupils shows that a large proportion are sons of officials, of Arab nationality, and from the province of Khartum. The report states, however, that the son of the Government official is generally less endowed with brains than the offspring of the illiterate peasant of the provinces or of the townsman following some very humble trade or calling. With regard to the subsequent employment of pupils of the college, the lean time of the depression has been succeeded by an extremely satisfactory state of affairs, and it is anticipated that in the course of the next few years the supply will not be equal to the demand. According to figures given for pupils who completed their full four years' course at the end of 1935 and 1936 respectively, the majority appear to secure appointments in permanent Government service. Of ten pupils from the scientific section in 1936, nine entered the Kitchener School of Medicine.

PNEUMONITIS

BY

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(WITH SPECIAL PLATE)

The rapid advance of radiological technique in recent years has enabled the clinician to gain a clearer conception of the nature of many pulmonary conditions, some mild, some serious, the physical signs of which are so similar as to render differentiation by clinical methods alone exceedingly difficult, if not impossible. Among the most important of these conditions is one which American authors[1] and more recently, English workers have termed pneumonitis.[2] By definition this name signifies an inflammatory pulmonary reaction. It is evident that the aetiology of such an inflammatory reaction is likely to be varied, and it is the purpose of this paper to present a practical classification of the condition. The following varieties of pneumonitis have been described: (1) acute simple; (2) secondary types; (3) chronic.

1. Acute Simple Pneumonitis

In a recent paper I gave an account of this disease as seen in children (Gill, 1937). Since then annotations have appeared in the *Lancet* (1937) and the *British Medical Journal* (1937), while Beaumont (1937) and Moncrieff (1937) now recognize the condition as a separate entity. After an intensive search through the literature one other account has been found which, under the heading of acute pneumonitis (Allen, 1936), undoubtedly refers to the condition here described.

Briefly, a child is brought to hospital for a cough of recent origin, anorexia, and loss of weight. There may be blood-stained expectoration, and the mother is sometimes suspicious of phthisis. The child is listless, the temperature is normal or slightly raised, the respiration rate is normal, and tachycardia is present. Examination of the chest reveals one or more areas over which the percussion note is slightly impaired, while on auscultation the breath sounds are normal or weak vesicular, and persistent medium "sticky" rales are audible. An *x*-ray examination reveals opacities in the zones under suspicion. Some enlargement of the hilar glands may be present. The white cell count is either within normal limits or is slightly increased. The erythrocyte sedimentation rate is raised. No treatment is necessary, and within a week or two the symptoms, signs, and radiographic changes completely disappear, the child's general condition improves, and he proceeds to regain his lost weight. Several cases have now been seen in adolescents and in adults, and examples of these, together with a further small series of cases in children, are described below.

CASES IN CHILDREN

Case 1.—A boy aged 4 years was brought to the out-patient department on April 1, 1937, on account of a cough and loss of weight amounting to 1 lb. over a period of two weeks. At the age of 1 year he had had pneumonia with bilateral otitis media, and subsequently, in fairly quick succession, measles, scarlet fever, and chicken-pox. He had undergone tonsillectomy two months previously. On examination the temperature was 100° F., the pulse rate 120, and respirations 20, and over the middle and lower zones of the left lung the percussion note was impaired, while on auscultation the breath sounds were vesicular and showers of "sticky" rales were audible. *X*-ray examination (Plate, Fig. 1) showed an opacity in this region, and a leucocyte count revealed a total of 13,200 cells per c.mm., of which 74 per cent. were neutrophils. The Mantoux tuberculin reaction (1 in 1,000)

was very faintly positive. Two weeks later the boy's temperature and pulse rate had dropped to normal, he no longer had a cough, his weight had increased by 2 lb., no abnormal physical signs could be detected on examination of the chest, and a further *x*-ray film (Fig. 2) showed that the pulmonary condition had completely resolved. It might be suggested from a consideration of Fig. 1 and the positive Mantoux reaction that the correct diagnosis in this case should be epituberculosis, but the rapid resolution negatives this.

Case 2.—A girl aged 7 years, who had previously suffered from pertussis and measles, was brought to the out-patient department on January 21, 1937, on account of a cough, anorexia, and loss of weight of two weeks' duration. On examination her temperature was 99.2° F., her pulse 116, and respirations 24, and over the upper and middle zones of the left lung the percussion note was impaired, while on auscultation the breath sounds were vesicular and medium "sticky" rales were audible. The Mantoux reaction (1 in 1,000) was negative, and a white cell count showed a total of 11,800 cells per c.mm., the differential count being normal. A simple cough linctus was prescribed, and two weeks later the child was symptom-free, had gained 4 lb. in weight, and on examination of the chest no abnormal physical signs could be detected.

Case 3.—A boy aged 7 years, whose previous illnesses included measles and pertussis, was brought to the out-patient department on October 17, 1936, on account of a cough and anorexia of three weeks' duration. On examination he was afebrile, his pulse was 120 and respirations 24, and over the base of the right lung the percussion note was impaired, while on auscultation the breath sounds were vesicular and rales were audible. *X*-ray examination showed heavy shadowing in this area, together with some enlargement of the hilar glands. Two weeks later the boy was symptom-free, had gained 2 lb. in weight, and no abnormal physical signs could be detected in the chest.

Case 4.—A girl aged 6 years attended the out-patient department on October 12, 1935, on account of a lump in the neck. This was thought to be a tuberculous gland. The Mantoux reaction (1 in 1,000) was positive, and a radiograph of the chest showed calcified deposits in the hilar glands. The child was kept under observation, and gradually the cervical gland became smaller until finally it was no longer palpable. A year later, on October 14, 1936, she attended again, complaining of a cough of a few days' duration, and on examination an impaired percussion note was found over the base of the right lung, while on auscultation air entry was weak and "sticky" rales were audible. Her temperature was 99.4° F. A radiograph showed an opacity extending from the left hilar region outwards into the left mid-zone and a further opacity in the right lower zone. A few weeks later the cough had gone, the child had gained 3 lb. in weight, no abnormal physical signs were present on examination, and a second radiograph showed that the opacities previously noted had cleared. It might be suggested that these pulmonary lesions were tuberculous, but the appearances were not those of epituberculosis, and parenchymatous tuberculous lesions would not have resolved in such a manner.

Case 5.—A girl aged 9 years, whose previous illnesses included scarlet fever, pertussis, and mumps, was brought to the out-patient department on May 27, 1937, on account of cough, anorexia, and loss of weight of some three weeks' duration. On examination she was afebrile, her pulse 96 and respirations 20, and over the base of the left lung the percussion note was impaired, while on auscultation air entry was diminished and "sticky" rales were audible. She was given a simple cough linctus, and at her second attendance two weeks later she was symptom-free, had gained 2½ lb. in weight, and no abnormal physical signs could be detected in the chest.

DIFFERENTIAL DIAGNOSIS

1. The usual diagnosis made in these cases is that of unresolved pneumonia, and yet there is no history to suggest any recent pneumonia or other inflammatory pulmonary lesion. The condition cannot be one of long standing, dating from some earlier illness, because the symptoms are recent in origin and resolution takes place within a week or two without treatment. For the same reasons simple pneumonitis should not be mistaken for the chronic pneumonias of infancy and childhood (Jaso and Fandos, 1934) or for subacute peribronchiolar pneumonia (Reichle and Moritz, 1934).

2. The comparative rapidity with which recovery takes place in simple pneumonitis, together with its benign course, renders differentiation fairly easy from most forms of tuberculosis of the respiratory system which are seen in childhood. Epituberculosis is sometimes more difficult to eliminate with certainty, but in this condition the Mantoux reaction is invariably positive, resolution is slow, and fever is usually absent (Moncrieff, 1934).

3. In a personal communication it has been suggested that simple pneumonitis is a form of allergic broncho-pneumonia (Feingold, 1935), a condition seen in asthmatic children and thought to be due to allergic changes in the respiratory tract, producing bronchial obstruction, parenchymal infiltration, and fever. However, none of the cases of simple pneumonitis seen at the Middlesex Hospital have had any allergic manifestations, either respiratory or systemic, nor is there any evidence of familial allergic phenomena. In order to show how allergic broncho-pneumonia differs from simple pneumonitis a case of the former is included in this series.

Case 6.—A boy aged 5 years was brought to the out-patient department on May 6, 1937, on account of bronchial asthma, from which he had suffered since the age of 6 months. There was a strong family history of allergy on the maternal side. On examination of the chest there was much bronchial spasm. He was afebrile, his pulse 112 and respirations 24. *X*-ray examination (Fig. 3) showed enlargement of the hilar glands, thickening of the septum between the upper and middle lobes of the right lung, and shadowing in the left cardio-phrenic angle. It was found that the boy slept on feather pillows and that there was a down coverlet on the bed. These articles were removed from the bedroom and the patient was given a mixture containing potassium iodide and stramonium. He began to improve, the physical signs in the chest disappeared, and further radiographs one month later showed that the shadowing in the left cardio-phrenic angle had cleared. The hilar shadows were smaller and the interlobar septum was no longer visible.

CASES IN ADOLESCENTS

Case 7.—A youth aged 17 attended the out-patient department on April 1, 1937, complaining of a cough, blood-stained

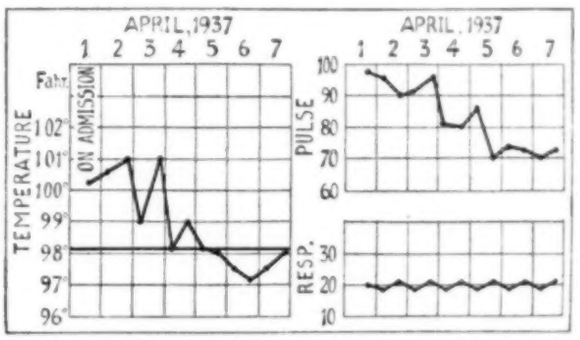

FIG. A.—Temperature, pulse, and respiration charts of Case 7.

expectoration, loss of weight, and anorexia, the symptoms being of three days' duration. He denied any previous illnesses, and stated that there was no tuberculosis in his family. On examination his temperature was 99.4° F., pulse 96, respirations 20, and at the left base the percussion note was impaired, air entry was weak, and rales were audible. *X*-ray examination (Plate, Fig. 4) showed enlargement of the hilar glands, together with a dense opacity in the left lower

zone. It was thought that the condition was probably one of basal tuberculosis, and he was admitted to hospital. However, examination of the sputum on three occasions failed to reveal the presence of tubercle bacilli, his temperature and pulse rate gradually settled (Fig. A), the blood sedimentation rate (Fig. B), which was raised, also dropped to normal, the abnormal

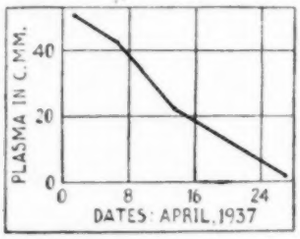

FIG. B.—Case 7: Blood sedimentation rates (Westergren).

physical signs in the chest gradually disappeared, and a further radiograph (Fig. 5) showed complete resolution of the pulmonary condition. He was discharged from hospital on April 30, 1937, afebrile and symptom-free, having gained 8 lb. in weight.

Case 8.—A youth aged 16 attended the out-patient department on May 3, 1937, complaining of a cough, expectoration, lassitude, and loss of weight. His symptoms were of two weeks' duration. Apart from an operation for acute appendicitis in 1934 he had had no illnesses in the past. There was no tuberculosis in the family. On examination his temperature was 98.6° F., pulse 96 and respirations 20, and over the base of the left lung the percussion note was impaired, air entry was weak, and medium rales were audible. The blood sedimentation rate was 22 mm. (Westergren), and a white cell count showed 6,200 cells per c.mm., the differential count being normal. No treatment was prescribed, and a week later the boy was symptom-free, had gained 2 lb. in weight, and no abnormal physical signs could be detected on examination of the lungs. He remains well, and his Mantoux reaction (1 in 1,000) is negative.

CASES IN ADULTS

Case 9.—A man aged 32 attended the out-patient department on December 17, 1936, complaining of a cough with slight expectoration of one week's duration. The sputum had been streaked with blood on one occasion. He had had no serious illnesses in the past. On examination of the chest the percussion note was impaired at the right base, breath sounds were vesicular, and persistent "sticky" rales were audible. An *x*-ray film showed an opacity in this region. The sputum was negative for tubercle bacilli. He was seen again one week later, when he complained, in addition, of pain in the right chest. The physical signs remained unaltered. He was sent home to bed for ten days, and at the end of this time confessed that he felt perfectly well. No abnormal physical signs could be detected in the chest, and a further radiograph showed that the opacity previously noted had cleared.

Case 10.—A man aged 60 came to the out-patient department on January 28, 1937, complaining of a cough, expectoration, and loss of weight of two weeks' duration. He stated that he had never had a day's illness up to this time. On examination he was pale and thin, and over the middle and lower zones of the right lung the percussion note was impaired, while on auscultation the breath sounds were vesicular and rales were audible in this area. He was afebrile, his pulse was 96 and respirations 20. *X*-ray examination (Fig. 6) revealed shadowing in the region under suspicion, and it was thought that his was a case of pulmonary fibrosis. A fortnight later, however, he was symptom-free, had gained weight, and no abnormal physical signs could be detected on examination of the chest. Further radiographs were taken, and the shadowing previously noted had almost entirely cleared. At the present time he is well and his Mantoux reaction (1 in 1,000) is faintly positive.

Case 11.—A man aged 26 was taken ill with malaise, cough, and expectoration on March 24, 1937. He was found to be febrile and to have a tachycardia, but there was no increase in the respiration rate. No abnormal physical signs could be detected on examination. The fever gradually settled, the tachycardia diminished, and the symptoms cleared, so that by April 6 the patient was well enough to be allowed up. As a precautionary measure an *x*-ray film was taken of the chest, and this (Fig. 7) showed mottling and increased striation in the upper zone of the right lung, the appearances being highly suggestive of pulmonary tuberculosis. However, in view of the patient's general well-being, it was decided to wait for three weeks and then repeat the *x*-ray examination. This (Fig. 8) showed that the pulmonary condition had completely resolved. Since this date the patient has remained in normal health.

DIFFERENTIAL DIAGNOSIS

Little need be added here to that which has already been said under the differential diagnosis of simple pneumonitis in childhood.

1. Recent pneumonia, unresolved pneumonia, and chronic pneumonia are readily differentiated for the reasons given above.

2. Disseminated focal pneumonia (Scadding, 1937) differs from acute simple pneumonitis in its initial symptoms, in the expectoration of purulent sputum, and in pursuing a more prolonged course with delayed resolution. Scadding suggests that disseminated focal pneumonia may be an earlier phase of the condition he has already described under the heading of chronic diffuse bronchopneumonia (Scadding, 1936).

3. As is well known, the majority of adult town-dwellers in this country have been infected by the tubercle bacillus; this primary infection in most cases leaves a healed focus somewhere in the body, but some of these people do not thereby acquire complete immunity, and proceed sooner or later to develop some form of phthisis. This stage of tuberculous pulmonary infection is called by Wingfield (1937) the "secondary" or "S" lesion. He states that the lesion consists of a central core of tubercle bacilli surrounded by a zone of allergic reaction, and, further, that if the deposit of bacilli is small enough and the host's immunity sufficiently high the whole lesion may disappear completely, leaving no trace. For this attractive theory no definite proof is offered, and, moreover, this teaching is contrary to the generally accepted view—namely, that pulmonary lesions containing tubercle bacilli heal by fibrosis, leaving scar tissue which can readily be detected by *x*-ray examination. Furthermore, those tuberculous pulmonary lesions, believed to be allergic, which occur in childhood invariably leave recognizable foci on healing—for example, Ghon lesions.

For these reasons, and also because several of the cases exhibited a negative Mantoux reaction, it seems evident that acute simple pneumonitis is not a manifestation of tuberculous infection of the lung.

PATHOLOGY

Since no fatalities have as yet been recorded in acute simple pneumonitis it is impossible to do more than conjecture as to the exact pathological process underlying the clinical and radiological picture constituting this condition. It was originally suggested (Gill, 1937) that the primary lesion may be a low-grade inflammatory process chiefly affecting the pulmonary alveoli. In a personal communication Beaumont has since pointed out that the same syndrome could be produced by partial obstruction of one or more bronchioles by a muco-purulent inflammatory exudate. The presence of blood-stained sputum in several cases suggests that the condition is either bronchiolar or alveolar, and not primarily a reaction of the interalveolar tissues. In the state of [illegible] further discussion, necessarily theoretical, would be [illegible]

2. Secondary Types of Pneumonitis

Several varieties of pneumonitis have been described, occurring as a secondary manifestation in some other disease.

(*a*) *Acute Influenzal Pneumonitis* (Bowen, 1935).—Some two to three days after the usual explosive onset of influenza the patient develops a cough, and on examination of the chest an area is found over which the percussion note is impaired, while on auscultation rales are audible. The respiration rate remains normal and the patient's general condition good, in contrast to those who are afflicted with influenzal pneumonia (Boyd, 1935) —toxic, prostrate, and cyanosed, the wings of death beating ever nearer. The following is an example of the clinical and radiological changes that occur in acute influenzal pneumonitis.

Case 12.—A man aged 28 was suddenly taken ill on April 25, 1937, with headache, shivering, dizziness, malaise, and fever. These symptoms persisted and were followed three days later by cough and expectoration. On admission to hospital his temperature was 100.6° F., pulse 92 and respirations 18. No abnormal physical signs were detected on examination. An *x*-ray film of the chest, however, showed (Fig. 9) an opacity in the right middle and lower zones, together with enlargement of the right hilar glands. A white cell count revealed a total of 16,000 cells per c.mm., of which 10,400 were neutrophils. On May 3 an area of dullness was found over the base of the right lung. The breath sounds in this region were vesicular and were accompanied by medium rales. The temperature and pulse settled to normal, the patient became symptom-free, and a further *x*-ray film on May 8 showed that the pulmonary condition was resolving, and by May 19, when he was discharged from hospital, the abnormal physical signs in the chest had cleared.

There is, of course, no proof that the above patient had influenza. However, he was taken ill during an influenza epidemic; other patients, suffering from influenzal pneumonia and lying in the same ward, offered a strikingly different clinical picture; and, finally, the symptoms—namely, headache, shivering, dizziness, and malaise—are in strict accord with those which have been laid down by Stuart-Harris (1937), one of the band of workers, comprising Andrewes, Laidlaw, and Smith, who have recently elucidated the problem of epidemic influenza. Indeed, Stuart-Harris in his paper gives a brief account of influenzal pneumonitis, and considers that the condition is a "bronchiolitis with patchy atelectasis." From such cases he was able to isolate the virus.

(*b*) *In Association with Pulmonary Abscess.*—Beaumont (1937) states that a pneumonitis may be the first lesion that develops in an area of lung before liquefaction occurs with cavity formation. Bowen (1935) and Beaumont (1937) use the term "pneumonitis" to describe the exudative inflammation that is so often seen around a lung abscess.

(*c*) *In Association with Bronchiectasis.*—All those physicians who are interested in respiratory diseases are familiar with the patient, a sufferer from long-standing bronchiectasis, who from time to time develops an acute exacerbation of his symptoms, with fever, lasting perhaps for two or three weeks and gradually settling at the end of this time. During this period the abnormal physical signs already present are increased, while radiographs reveal opacities extending from the bronchiectatic areas into normal lung. With defervescence of the fever the symptoms and physical signs return to their former degree, and further radiographs show resolution of the inflammatory areas. Such a process is admirably and concisely described as a pneumonitis.

(*d*) *In Association with Other Pulmonary Lesions.*—A similar process to that just described under bronchiectasis may be seen in connexion with bronchial neoplasms, pulmonary emboli, and pulmonary collapse (Beaumont, 1937).

(*e*) *In Association with Vincent's Infection.*—Cahan (1927) and Davis and Harper (1931) have reported cases in which, during the course of a Vincent's angina, the physical signs and radiological appearances of a pneumonitis have developed in one or more pulmonary areas. These lesions have resolved after the exhibition of arsenicals.

(*f*) *In Association with Rheumatism.*—Klein (1934) reports the case of a little girl suffering from chorea and rheumatic carditis complicated by pneumonia. On somewhat scanty evidence he concludes that the latter condition is a rheumatic manifestation.

3. Chronic Pneumonitis

Cases of chronic pneumonitis are reported in the literature from time to time (Colton, 1927; and Cabot Case 20092, 1934). It would appear that the essential lesion is a progressive pulmonary fibrosis of unknown aetiology. Some of these patients eventually develop pure right heart failure, which may prove fatal.

Summary

1. An account is given of pneumonitis, a term used to describe a recently recognized type of inflammatory pulmonary reaction.

2. Pneumonitis is divided primarily into three main groups—acute simple pneumonitis, secondary types of pneumonitis, and chronic pneumonitis.

3. Examples are given of acute simple pneumonitis as it occurs in children, adolescents, and adults.

4. Secondary types of pneumonitis include acute influenzal pneumonitis and pneumonitis in association with pulmonary abscess, bronchiectasis, bronchial neoplasms, pulmonary collapse, pulmonary embolism, Vincent's angina, and possibly rheumatism.

Dr. G. E. Beaumont has given me invaluable help and criticism in the preparation of this article. I am indebted to Dr. C. E. Lakin, Dr. T. Izod Bennett, and Dr. Alan Moncrieff for permission to publish cases under their care; to Professor James McIntosh for the white cell counts; and to Dr. Graham Hodgson for permission to reproduce the *x*-ray films.

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SPONTANEOUS DISAPPEARANCE OF CARCINOMA

BY

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(WITH SPECIAL PLATE)

It has long been recognized that carcinoma of the large intestine is a very slow-growing form of malignant disease, and it is being realized now that its rate of growth is probably even slower than we had previously thought. It is not until some degree of obstruction begins to make its appearance that our advice is sought, and if we go carefully into the history we may find evidence of some indefinite abdominal symptoms which may go back for as long as two or three years. Even when the disease has been present for this length of time the outlook is comparatively favourable if the acute obstructive condition is relieved and the growth subsequently removed. When we open the abdomen in these cases we usually find a comparatively small primary lesion, with some enlargement of the glands in the mesocolon. It is only in the later cases that we find involvement of the aortic glands or secondary deposits in the pelvis with free fluid. Secondary nodules in the liver are also, as a rule, a late phenomenon. The latter two forms of extension are usually regarded as contraindicating any form of radical surgery.

Case History

A man aged 41 was seen on March 29, 1927, when he gave a history of attacks of pain in the left side of the abdomen for some considerable time. These had been diagnosed as due to renal colic, and he was eventually *x*-rayed, with negative results, in December, 1926. Colicky abdominal pain and increasing constipation began to be felt four weeks before he came up for treatment. For ten days he had noticed his abdomen becoming fuller, and he had commenced to vomit. At the time of his admission he had absolute constipation. He was obviously suffering from acute intestinal obstruction, and as he gave no response to enemata his abdomen was opened by a right paramedian incision. A growth was found in the descending colon, and the gut above it was very much distended. His caecum was brought out through a separate incision in the right iliac fossa and a Paul's tube tied into it. Three weeks later his abdomen was reopened by a left paramedian incision and examined in more detail. The distension of the gut was considerably less. One or two of the paracolic glands were enlarged, and on sweeping the hand over the convex surface of the right lobe of the liver a nodule which was hard and about the size of a pea was felt on its surface. This was taken to be a secondary deposit and seemed to exclude any hope of resecting the growth. It was felt undesirable to leave the patient with a caecostomy on account of the difficulty of controlling a liquid discharge, and the choice lay between a short circuit and a partial colectomy. The left half of the colon was mobilized and a piece stretching from the left side of the transverse to the upper part of the sigmoid colon was removed. The two ends were closed and continuity was restored by a side-to-side anastomosis.

The pathological report on the specimen read as follows: "The growth is a typical adenocarcinoma, showing some mucoid degeneration in parts. It almost encircles the gut, causing some narrowing. Melanosis is present above the growth." Two photomicrographs are here reproduced (see Plate).

Following the operation his caecostomy opening gradually got smaller and he was discharged with it practically closed five weeks later. For about eighteen months he was seen periodically because of some leaking from it, and it then appeared to close finally. During this time his general health improved and no sign of any further growth was seen. He went to Ireland for business reasons at this time and nothing more was seen of him until February, 1937, when he came up with a history of three weeks' constipation. His general health had been good for the ten years since his operation. He had been so well that his business affairs had prospered; but he was worried, as he knew that a growth had been removed and he was afraid of a recurrence. There was still no sign of a return of the growth, and a barium enema showed a colon, with no sign of any obstruction, in which it was practically impossible to tell that a resection had been done. He was reassured, and has now returned to his work.

Discussion

The interest in this case centres on the nature of the nodule that was felt in the liver. The obvious diagnosis was of a secondary carcinomatous nodule, but there was no verification of this with absolute certainty. Simple liver tumours occur occasionally and are usually accidental findings at a post-mortem examination, so that there is no reason why they should not be accidental findings during the course of an operation for some other condition. We are thus left with the two alternative diagnoses of a secondary deposit and a simple tumour such as a bile-duct adenoma. Except for the subsequent history the former of these would appear to be the more likely.

There is no doubt that carcinoma can and does disappear spontaneously, as instanced most strikingly in Pearce Gould's (1910) classical case. Further, we know that cancer cells which are carried to the liver and the lungs are often destroyed and that they do not always give rise to metastatic growths. Teacher (1908), in an article on the development and natural healing of secondary tumours of chorion-epithelioma malignum, brings forward evidence to show that haemorrhage and thrombosis in a tumour are able to destroy the tumour cells, and that healing is brought about by a process of encapsulation within a zone of actively growing connective tissue and blood vessels which invade the tumour nodule.

It is said that in tuberculosis when there are two foci of disease the elimination of one may allow the natural defence mechanisms to overcome the other, whereas the two together might be progressive and beyond the patient's power to deal with. May it not be that a similar state of affairs holds in cancer and that the question of dosage is an important one? It is possible that cancer cells may be left behind after radical operations, and that we may congratulate ourselves on having removed the disease in its entirety when it is really the natural resistance of the body that has made our efforts successful.

It is usually held that the presence of one growth protects its host from the development of another, probably on account of the elaboration of some antibody which makes its way into the circulating blood. Thus in the tar warts which are produced in the experimental animal only one of them becomes malignant, and in polyposis of the colon, which is well known to be precancerous, only one polypus shows a malignant change. The removal of the carcinoma in such a case may be followed at a later date by the appearance of a malignant change in one of the other polypi or warts. The two cases are, however, hardly parallel. Here we are dealing with an actual growth and a potential one, whereas in the case I am reporting there were two established foci, one certain and the other probable.

We know, further, that cancer cells may remain latent, presumably encapsulated by a fibrous tissue reaction. This is the only possible explanation of the late recurrences sometimes seen. I would instance a patient whom I saw recently who had a radical removal of the breast done for carcinoma, and who came up twenty years later for a recurrence in the lumbar spine. In this particular case it is certain that the deposit was there at the time of the operation. I am suggesting that operation, by cutting down the amount of cancer present, allows it to be successfully dealt with and shut off. Then at a later stage some other factor comes into play, possibly trauma, possibly a lowering of the general health of the patient, and the cancer cells resume their interrupted activity.

I do not wish to imply that partial operations should be undertaken, or that radical removals of a primary source should be done in the presence of gross secondary deposits. I am only placing this case on record to show that a patient who might have been regarded as hopelessly inoperable is still alive and well after an interval of ten years.

Summary

A case of carcinoma of the descending colon associated with a nodule in the liver is reported in which the patient is alive and well ten years after a partial colectomy.

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THE PLANTAR WART

VERRUCA PLANTARIS: VERRUCA PEDIS: PLANTAR PAPILLOMA

BY

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(WITH SPECIAL PLATE)

At the present time there is a widespread epidemic of plantar warts among school children. So far as my experience goes the epidemic is most severe among adolescent girls, although I have seen several boys whose ages ranged from 8 to 17 years suffering from the complaint. In South-West Lancashire the epidemic scarcely affects the so-called hospital classes, and the majority of cases are in children who attend boarding-schools; it would seem to be unduly optimistic to believe that all classes of the community will not be soon infected. Until recent years this type of wart has not been prevalent, and it is difficult to discover why the present epidemic has developed.

Plantar warts (or "verrucas," as they are called by many patients and some chiropodists) are a minor malady, but when they have reached an average size they considerably curtail the activities of the person affected, owing to the pain caused by pressure on the warts whenever he attempts to walk or run. The warts develop insidiously. The first sign is the formation of a small semi-translucent macule, 1 to 2 mm. in diameter. There are no signs of inflammation. The macule is slightly painful on pressure, but is usually disregarded by the patient, who, if he considers the matter at all, believes that he has a tiny piece of grit embedded in the sole of his foot. The lesion, as a rule, develops on the heel or the ball of the foot, but may appear on any part of the plantar surface, including the toes. The macule increases slowly in size until it reaches a diameter of approximately 0.5 cm., when the wart may be regarded as being fully formed. On examination one finds a roughened, hyperkeratotic type of lesion, greyish yellow in colour, and its papillomatous nature is usually not apparent until the wart is pared with a knife. Satellite warts develop, and it is not uncommon to find as many as ten warts on one foot. The subjective symptoms vary with the site of the warts and the stoicism of the patient. One can generally obtain a history of throbbing pain, which is most severe when the patient gets out of bed in the morning or when he puts on his boots and starts to walk. The pain usually diminishes after he has been standing for some little time. He may complain that the warts throb when he has a hot bath.

Plantar warts have to be differentiated from callosities due to pressure; but medical men are so accustomed to recognizing callosities due, for example, to dropping of the anterior arch of the foot or to faulty shoes that the differential diagnosis is not often a matter of difficulty. In a doubtful case one should remember that whereas little or no pain is experienced when a callosity is pressed, the patient always complains of severe pain if a plantar wart is treated similarly; further, if the lesion is pared down the papillomatous nature of the wart becomes apparent.

Aetiology and Pathology

There is little doubt that plantar warts are caused by a filter-passing virus. It is probable that individual susceptibility to this virus varies considerably, but the virus is virulent and appears to be able to obtain a secure foothold on skin which to the naked eye reveals no sign of abrasion. Whilst the virus probably cannot develop or multiply except on a medium of living cells, it is reasonable to presume that it can remain alive for some minutes, if not for a few hours, on areas where an affected foot has pressed. If the superficial layers of a wart are shaved off the closely packed papillae are revealed. The papillae are in most cases yellowish white in colour, but may be stippled with red or brownish stains where haemorrhage has occurred. They are encircled by a tough horny collar. The lesion is broader at its base than at the opening on the surface of the skin.

The histology has been described by MacLeod (1933) in the following terms: "Microscopical sections show hyperkeratosis at the periphery, and marked acanthosis and elongation of the interpapillary processes in the centre. Towards the centre of the processes the prickle cells tend to be vacuolated." Inclusion bodies may be found in these vacuolated prickle cells.

Treatment

Treatment must be divided into two categories, preventive and active. In my opinion preventive treatment is of the utmost importance at the present time, and I would urge that all doctors who are in charge of schools should institute regular inspection of their pupils' feet, at least until the present epidemic has passed. School children suffering from plantar warts should be segregated so far as dormitory accommodation is concerned. They should have their own bathrooms and changing-rooms, and should not be permitted to use the school swimming-bath. Special care should be taken that their boot lockers are far removed from their colleagues', whilst the bootblack should have instructions always to clean the patients' boots in a batch after he has finished with those belonging to the rest of the school.

In private houses similar precautions should be taken. The infected person must never tread with bare feet where an unaffected person will step. On leaving his bath he should step on to his own bath mat, which should be removed from the bathroom as soon as he leaves. No one else should use his bath towel, and probably it is safer to swill down the bath with a weak antiseptic after he has used it. The evidence is not conclusive, but it is probable that the infection is more usually contracted in bathrooms than elsewhere. So little is known about the dissemination of the wart virus that it is better to be overcautious rather than risk dissemination of the virus by lack of caution.

In the earliest stages the warts can in most cases be destroyed by the use of a wart paint—for example:

℞ Zinci chloridi ... ... ʒ ss
Collodium acid. salicyl. (1 in 10) ... ad ʒ i
Misce.

A spicule of wood should be dipped into this paint and then bored gently into the wart. The treatment should be carried out twice daily, and if the patient is placid the results are usually satisfactory. Many persons complain bitterly that they cannot stand the pain, and other measures have to be employed.

Most dermatologists prefer to use radium or *x* rays, and these physico-therapeutic agents are the least painful methods of treatment and the most certain in their results. In my experience, using *x* rays filtered through 0.5 mm. aluminium, a plantar wart requires an average of 900 *r* units of *x* rays before it succumbs. While receiving treatment it is advisable for the patient to wear white cotton socks underneath his usual socks throughout the day. These socks should be boiled every night. The feet may be powdered with an antiseptic dusting powder.

If physico-therapeutic measures are not available excision may be attempted. In my hands local anaesthesia has not been very successful: I have found it to be almost impossible to infiltrate the part with novocain without causing much pain. I prefer to use a general anaesthetic (nitrous oxide or gas-and-oxygen). The warts should be scraped out with a sharp curette. It is surprising how deeply the roots are situated. I have found it best to remove the horny collar which surrounds each wart, as recurrence is frequent if this is left. Bleeding should be controlled and the area disinfected, so far as is possible, by the application of the silver nitrate pencil. Dry dressings are usually adequate, and healing is complete in about fourteen days. Diathermy or refrigeration with carbon dioxide snow are alternative measures. Goldsmith (1936) recommends that the "snow" should be applied for three to five minutes: a large bleb will develop, allowing the wart to be painlessly excised about three days later. Good results have been claimed for treatment by cataphoresis with zinc sulphate.

Chiropodists often treat these cases successfully. They generally aim at destruction of the wart by escharotics or keratolytics. Runting (1935) states that their object is "to destroy the growth so thoroughly that such a reaction may be created in the healthy tissue as to bring about a line of cleavage between the destroyed growth and the normal healthy tissue. The culmination of this process is usually accompanied by effusion of serum or sero-pus. . . . The whole art of the successful destruction of verrucae depends upon inducing this condition effectually without causing more disturbance to the normal tissue than is actually essential to the cure." "The majority of chiropodists bring about the desired result with acids, such as nitric, acetic, monochloracetic, trichloracetic, salicylic, chromic, pyrogallic, or acid nitrate of mercury; or with such powerful alkalis as potassium hydroxide or sodium hydroxide."

In the majority of cases the surrounding tissue is protected by an application of vaseline, and the acid or alkali is applied with an orange stick and "worked into the growth." A protective dressing is employed and a few days later the treatment is repeated, the tissue which has been destroyed by the previous treatment being removed before fresh acid or alkali is applied. By proceeding slowly and giving regular treatments the warts are destroyed with a minimum of pain. The use of pyrogallic acid is effective and is not associated with much pain unless the application is left *in situ* too long. The acid is applied as an ointment (30 to 50 per cent. in ung. resinae) once or twice weekly, the usual occlusive precautions being observed.

Summary

Attention is drawn to an epidemic of plantar warts among school children.

A short description of the signs, symptoms, aetiology, pathology, and treatment of the warts is given.

[The photograph in the Special Plate is reproduced from *Diseases of the Skin* (fourth edition), published by Messrs. Baillière, Tindall and Cox.]

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INTRATHECAL ALCOHOL INJECTION FOR RELIEF OF PAIN: A REVIEW

BY

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Dogliotti in 1931 first suggested the use of subarachnoid injections of absolute alcohol as a simple and comparatively safe means of alleviating severe chronic pain of which the cause is not amenable to treatment. He pointed out that the various surgical measures designed to relieve pain (posterior rhizotomy, chordotomy, sympathectomy) are operations to which many patients suffering from such conditions as advanced malignant disease cannot justifiably be submitted; nor are they always successful. Paravertebral nerve-blocking is an alternative, but it is difficult to carry out and is uncertain in its effects.

Dogliotti's aim in devising this method was to bring about a partial destruction of the appropriate posterior nerve roots close to their entry into the spinal cord. Accepting the assumption that pain is proportional in severity to the numerical strength of the sensory impulses reaching the centres concerned, he argued that this "decimation" of the afferent nerve fibres should reduce the pain-provoking stimulus below threshold value. From animal experiments he satisfied himself that it is possible to limit the action of the alcohol with sufficient precision to the posterior roots; only when the doses used were excessive did symptoms of motor paralysis follow the injections.

Principles of Treatment

The principle underlying the method is that absolute alcohol possesses a specific gravity considerably lower

than that of cerebrospinal fluid. It can be demonstrated *in vitro*, by using alcohol coloured with a dye, that it floats on the surface of cerebrospinal fluid for several minutes with very little admixture It is therefore possible, by placing the subject in a suitable position, to introduce alcohol into the subarachnoid space in such a way as to cause it to come into contact with the posterior roots it is intended to destroy, but not with other structures which it would be undesirable to injure.

Dogliotti himself in his original paper described forty-five cases of various kinds (all non-malignant) treated in this way with doses ranging from 0.2 to 0.8 c.cm. Of these patients twenty-seven (60 per cent.) were partially relieved, and nine (20 per cent.) were unrelieved, or almost immediately relapsed, or were lost sight of (one case). Since that time much the same degree of success has been achieved in both malignant and non-malignant cases by workers using this method or some modification of it. The literature includes papers by Yeomans (1933), Saltzstein (1934), Stern (1934 and 1936), Sloane (1935), Grant (1935), Silverstein (1935), Rowe (1935), Greenhill and Schmitz (1935 and 1936), King (1935), Babcock (1935), Abbott (1936), Meynier (1936), Russell (1937), and Todd (1937). On injection the relief of pain is often immediate, but is sometimes delayed for a considerable period —according to Dogliotti as long as forty days. In a number of cases the first injection has been unsuccessful, but pain has been completely relieved by a second. Todd (1937) in two cases found it necessary to repeat a successful injection in three months. The length of time for which the effect of treatment is felt has varied in the recorded cases. Dogliotti gave the maximum as six months, and Stern as eight months. In Todd's series the maximum period of relief was sixteen months and the average period five months.

The effects of alcohol injections upon the cord and nerve roots have been studied post mortem in a few instances; they are extremely slight. In Todd's cases they included extreme congestion of the vessels around the nerve roots and throughout the lower part of the cord, thickening and hyalinization of the vessel walls, and some perivascular deposit of hyaline fibrous tissue. Ritchie Russell reported demyelinization of nerve fibres and cellular infiltration both in the posterior nerve roots and in the column of Goll in two cases examined twelve months and nineteen months respectively after alcohol injection. Dogliotti found that the cerebrospinal fluid examined a few days after an injection is under increased pressure and shows a slight increase of albumin and of leucocytes. Normal conditions are restored in about ten days.

Technique of Injection

The method used by different workers has varied somewhat, but in most cases either absolute or 95 per cent. alcohol has been given in doses of 0.2 to 1 c.cm. without previous withdrawal of cerebrospinal fluid or barbotage. In one only of the recorded cases was barbotage employed. Meynier (1936) withdraws 10 c.cm. of cerebrospinal fluid and injects an equal quantity of dilute alcohol (5 to 7.5 per cent. solution of absolute alcohol in distilled water), introducing it "rather rapidly." In view of possible dangers it is best to begin with small doses and repeat the injection, using a larger dose, if necessary. The treatment can quite well be given to the patient in bed, though it is easier to arrange and maintain the required position on an operating table furnished with a kidney bridge. A general anaesthetic is very rarely necessary, but local anaesthesia may be used if desired.

Having decided which nerve roots are to be the objective—taking into consideration the innervation of the diseased organ and the situation of the pain—the interspace to be employed for the injection is calculated from the known relation between the spinal segments and the bones of the vertebral column. The risk of injuring structures other than the posterior roots in question is minimized by introducing the alcohol as close as possible to the point of emergence of the latter from the cord. When, therefore, the lumbar or sacral roots are the objective the very general practice of making the injection through a lumbar interspace is open to criticism. Since the spinal cord does not extend, at most, lower than the first lumbar interspace, alcohol introduced below this point will come in contact with the nerves of the chorda equina, where its effects cannot be accurately localized. It is technically easier to introduce a needle through a lumbar than through a dorsal interspace, but it would seem to be much safer to use the space most nearly corresponding to the spinal segments involved.

The patient is placed on the side opposite to that on which the pain is felt; if the pain is bilateral, on the side on which it is less severe, supposing there is any inequality. The spine is well flexed in a forward direction and the head lowered either by raising the foot of the bed or by tilting the operating table. The spine is flexed laterally by means of pillows or sandbags or by elevating the kidney bridge of the operating table, so placed that the site of the proposed injection is raised and the spinal segments corresponding to the nerve roots aimed at become the highest part of the spinal cord. At the same time the body is inclined forward at an angle of 45 degrees. This brings the posterior roots into a horizontal position, where the greatest possible length is exposed to the action of the alcohol, while the motor roots are brought into a plane in which they are less likely to be damaged. The puncture is made in the midline with an ordinary fine lumbar puncture needle. When puncturing a dorsal interspace it must be borne in mind that the needle must be introduced obliquely upwards as well as forwards, in a plane almost parallel with the skin surface of the back. To avoid injury to the cord in this region it is safer to remove the stylet from the needle before it enters the theca. It is dangerous to make a puncture above the dorsal region.

As soon as the needle is well in the subarachnoid space the syringe containing the measured dose of sterile alcohol is attached and the alcohol very slowly injected, at a rate of about 0.4 c.cm. a minute. After the injection is finished the patient is kept in exactly the same position for a time sufficient to allow the alcohol to act upon the posterior roots. The period allowed for this by different workers varies from ten minutes (Stern) to two hours (Greenhill and Schmitz). At the end of that time he is placed flat on his back and left in that position for twenty-four hours. It is wise to keep the foot of the bed raised for the first few hours. If it be necessary to repeat the injection either on the same or on the opposite side an interval of five to seven days should elapse before this is done.

A feeling of burning may accompany the introduction of the alcohol, but this quickly passes off. Pain may stop immediately, or, as already mentioned, its relief may be gradual. Dogliotti observed in many of his patients that immediate cessation was followed by a temporary return of the pain, lasting for some hours or days and succeeded in its turn by gradual relief. There may also be transient numbness and weakness of the leg on the side of the injection, sometimes associated with temporary loss of the tendon reflexes. In some cases more serious

motor disturbance has occurred, such as paraplegia, retention of urine, or loss of control of the sphincters. For the most part these symptoms have passed off after some hours or days; in a few of the cases a greater or less degree of disability has persisted. Silverstein's patient, a tabetic, was left with complete motor and sensory paralysis of the leg, but in this case an unusually large dose of alcohol (9 c.cm.) was given. In Sloane's patient, also a tabetic, there was retention of urine and faeces, abolition of the ankle-jerk and paresis of the muscles of the lower leg on both sides—more pronounced on the side of the injection—and anaesthesia of the back of the thigh and leg and of the peri-anal region, complete on the side of the injection and partial on the opposite side; a certain degree of weakness of the legs and difficulty with micturition was permanent. Babcock also observed persistent weakness of the leg. In one of Todd's cases a meningeal reaction occurred, but this subsided spontaneously in four days. One death has so far been reported—by Abbott, in a patient in the last stages of malignant disease who died the day following the injection. Russell's series of twenty-five cases included one case of retention of urine and three cases of sphincter paralysis; and among Todd's eighteen cases retention of urine and incontinence of faeces occurred in two and incontinence of faeces alone in one. In all these cases, and in others reported in the literature, recovery took place within a few days. The longest time taken for recovery from these sphincter disturbances has so far been two weeks. One case of diarrhoea lasting three weeks has been reported (Greenhill and Schmitz).

The comparative rarity of motor disturbances after subarachnoid injection is probably due in part to the relative insensitivity to alcohol of motor as compared with sensory fibres; it is difficult otherwise to understand why these disturbances do not more often accompany injections given in the region of the cauda equina.

One case may be added to those collected from the literature. This patient, a woman of 57, was suffering from intense pain in the right side of the abdomen associated with generalized melanotic disease of the liver, secondary to a malignant melanoma of the choroid for which the right eye had been removed five years before; the pain was constant and relieved by morphine only to a very slight extent and for an hour or two at a time; she was worn out from lack of sleep. The diagnosis having been confirmed by exploratory laparotomy and biopsy, 10 minims of 95 per cent. alcohol were injected through the seventh dorsal interspace. The injection was wholly unsuccessful. It was therefore repeated a week later, the dose being increased to 20 minims. This time relief was immediate and complete. Neither injection was followed by complications of any kind.

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THE EFFECT OF IRON ADMINISTRATION IN CASES OF SUBNUTRITION

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It is a pity that medical officers in charge of a welfare centre under the control of a local authority do not more often publish their experience at the centres. The number of children attending is usually large and the work done excellent, but the amount of literature relating to these clinics is much too small. One realizes that the difficulties of research work are many, the greatest of them being the lack of co-operation from parents. Numerous plans are conceived and much work started; but the result is *nil*, as parents will not bring their children along for examination often enough, and so results that are promising cannot be put in the tabulated form necessary for publication. This is a great loss to the general practitioner, who often has little chance of obtaining experience in the pathology or even the physiology of infant life during his first few years of practice. The following work was carried out partly at a toddlers' clinic (children from 1 to 5 years old) and partly at the laboratory, both under the control of a local authority (county borough, population 150,000). For reasons already mentioned the figures were not nearly so complete as one would desire, but they are of value as showing a positive result from a simple and cheap form of therapy for a certain defect prevalent among children in the poorer-class districts of many boroughs.

At the clinic under consideration the children attending belonged to families whose chief breadwinner was often unemployed for long periods, and whose food was therefore mostly of the cheap variety. The proteins necessary for adequate growth were seldom present in the daily menu. The children's food consisted in the usual energy-producing carbohydrates, mostly in the form of wheat of different millings made edible by the addition of animal or vegetable fat. During the summer first-class proteins such as eggs, fish, and meat could be bought, but in the winter, when these foods were most necessary, they were often lacking, and malnutrition therefore followed.

Many of the children attending the centre had pale mucosae, and showed lack of energy, anorexia, subnutrition, and dullness of spirit. It was decided to try the effect of the addition of iron to their diet, unaided by anything else that might cause a diminution in the existing subnutrition. The children were chosen and sent to the laboratory, where complete blood examinations (cell count, films, and haemoglobin estimation) were carried out. In order to reduce the passive opposition of the parent this blood examination was made only at the first attendance, subsequent investigation being confined to estimation of the percentage of haemoglobin. In this way we could eliminate those children who were not actually anaemic though appearing so on clinical examination. All the children selected, however, were anaemic both on clinical and on biological grounds.

The parents were not advised regarding diet, but were merely given a bottle of ferri et ammon. cit., to be taken by the children once daily in any form of food. The first

advice to a new parent attending the clinic is in regard to a balanced dietary, but with the children under consideration this was avoided in order to demonstrate the effect of the addition of iron to their normal meals. After a course of iron appetites improved, the mucous surfaces became less pale, and the children became more active and showed an increased vitality generally.

It will be noted from the tabulated results given below that there was a definite rise in the percentage of haemoglobin. From the clinical improvement noted in the children this was expected. In order to avoid giving a detailed account of the rise in the percentage of haemoglobin and the blood pictures obtained from each child, a table is appended to show the average rise in haemoglobin over the series of children who attended weekly for examination. The blood picture is the average for thirty-one children, but since the attendance for examination diminished each week, owing to ailments and lack of co-operation from parents, the results given at the end of the sixth week are completed from a smaller number. Clinically, however, all the children maintained their immense improvement in health and general activity while taking a daily dose of iron. Considering that the iron cost the parent only 1½d. per week one feels it to be worthy of trial in any case where a child shows a lack of normal vitality. Had advice regarding diet been given in conjunction with the addition of iron to the food we could have obtained a more pronounced rise in the haemoglobin percentage and a greater improvement in the general health of the children. It is gratifying to note that some firms who market dried full-cream milk are now adding an adequate dose of iron to the food, and not the small amount so often met with a few years ago, an amount which would fail to give any satisfactory rise in haemoglobin.

Table showing the Blood Picture before giving Iron to Thirty-one Children (Average Age, 2½ Years)

Average number of red blood cells per c.mm.	3,840,000
Average percentage of haemoglobin	66
Percentage showing anisocytosis	84
" " pallor	35
" " poikilocytosis	16
" " polychromatophilia	7
" " punctate basophilia	3

Conclusion

Many of the children attending a toddlers' or infant clinic under the direction of a local authority show a clinical anaemia (confirmed by blood pictures) although no definite defect appears to be present, apart from subnutrition and pale mucous surfaces. These children should be given a regular daily dose of iron over a period of at least six to eight weeks, even though they are getting insufficient food. If their blood picture does not show an improvement further investigation will be necessary. Where the clinical finding fails to suggest a physical defect the administration of a course of iron on empirical grounds will often save much further investigation of a more difficult nature.

Table showing the Average Percentage of Haemoglobin at the End of Each Successive Week while taking a Daily Dose of 20 grains of Ferri et Ammon. Cit.

Before taking Iron	Weeks After taking Iron					
	1	2	3	4	5	6
66.6	66.6	69.5	73.7	74.7	75.9	78.0

Summary

1. The average blood picture of thirty-one children under the age of 5 years (average age 2½ years) is given, showing signs of anaemia clinically.

2. A table is included to demonstrate the effect of a simple addition of iron to children's diet, which is left unchanged in other respects.

3. These children were chosen from a welfare centre in a poor-class district in Birkenhead, where unemployment is prevalent.

4. The cost to the parent per child per week amounted to 1½d. for the ferri et ammon. cit.

5. No advice was given to parents regarding diet for children.

We wish to thank Dr. D. Morley Mathieson, Medical Officer of Health, Birkenhead, for granting us the facilities for carrying out this work.

Clinical Memoranda

Block Anaesthesia for Insertion of Radium to Epithelioma of Lip

(WITH SPECIAL PLATE)

The use of block or local anaesthesia, either alone or combined with gas and oxygen or any other general anaesthetic, often seems to be neglected, perhaps through lack of opportunity or from prejudice on the part of the patient, the anaesthetist, or the surgeon. The following account appears to be worthy of record as illustrating the indispensable use of block anaesthesia in a case which presented considerable difficulty with regard to the anaesthetic.

The patient, a man of 77, was suffering from an extensive epithelioma of the lower lip. The growth involved the left corner of the mouth and extended along the lower lip to within half an inch of the right corner. The patient was frail and quite unsuitable for a general anaesthetic, and had given cause for great anxiety when under gas and oxygen for the extraction of teeth. The intravenous barbiturates were out of the question in view of the patient's age and general condition, so local anaesthesia seemed to be the method indicated. Local infiltration is not ideal for radium cases, as the ensuing sogginess of the tissues, added to the reaction of the radium itself, is apt to cause more sloughing than is usual. The only solution appeared to be in block anaesthesia sufficiently far away to leave the operation site untouched.

An hour before operation the patient was given one-sixth grain of morphine and 1/150 grain of hyoscine, and fifteen minutes before operation a right and left mandibular injection by the indirect method, 2 c.cm. of anaesthetic fluid being injected at each inferior dental foramen. To anaesthetize the left corner of the mouth the infra-orbital nerve was dealt with by the deposition of 2 c.cm. of anaesthetic fluid at the left infra-orbital foramen and gently massaged upwards. On being questioned the patient now said that his lower lip was tingling and he was unable to feel the prick of a needle, proving that the mandibular injections were working efficiently. Each of the long buccal nerves was injected with 1/2 c.cm. to anaesthetize the mucous lining of the lip. All these injections were of course given inside the mouth. The patient's eyes were then bandaged and he was taken into the theatre, the towels placed in position, and the lip prepared. After the insertion of the first radium needle the patient fell asleep, and remained asleep and snoring until roused by the removal

of the bandage from his eyes at the completion of the operation.

A dental syringe fitted with a fine 42-mm. needle was employed. The anaesthetic used was procaine solution with epinephrin (novol)—each cubic centimetre containing 0.02 gramme of procaine hydrochloride (novol) and 0.00003 gramme of epinephrin made isotonic with buffer salts.

I am indebted to Miss Lewis, M.S., F.R.C.S., for permission to publish this case and also for the loan of the photograph of the patient.

PHYLLIS F. L. DAPLYN, M.R.C.S., L.R.C.P., D.A.
Honorary Anaesthetist, Royal Free Hospital; Honorary Consulting Anaesthetist, Eastman Dental Clinic.

Foreign Bodies in the Intestinal Tract

The surgeon is often obliged to perform operations for removal of foreign bodies from the intestinal tract. The patients are mostly children in whom the swallowing of a foreign body has been accidental or mental patients with whom it is either a symptom of disease or an attempt at suicide. In these cases the operation is nearly always performed from fear of subsequent "perforation" or to remedy intestinal obstruction. Furthermore, the identity of the foreign body is usually known.

The following case is of special interest because of the difficulty in diagnosis which was presented both to clinicians and to radiologists.

CASE RECORD

A male convict in the Shanghai municipal gaol, aged 24, was admitted to hospital complaining of pain and swelling on the right side of the abdomen. He could recall no other serious illness, and the family history was very vague and essentially negative. The onset of the illness was apparently insidious, but the patient referred to attacks of pain in childhood, and vaguely mentioned having swallowed some fruit-stones many years ago. For the past ten years he had suffered from frequent attacks of acute colicky abdominal pain, lasting some two hours on each occasion. These attacks were not associated with vomiting or diarrhoea and had no relation to food. He also stated that for over ten years he had had a swelling in his right side. Bowel action was regular and without pain. The present attack was identical with previous ones.

Examination.—The patient was well developed, without any signs of wasting. The cardiovascular, pulmonary, and nervous systems and the urine showed no abnormalities. The stools contained no ova. Examination of the abdomen revealed no tenderness or rigidity. The liver, spleen, and kidneys were not palpable. A round firm non-tender mass was palpable to the right of the umbilicus: it was mobile and also moved with respiration. There was no definite edge to the tumour. The differential diagnosis based on the presence of this tumour associated with a history of attacks of colicky pain was as follows: hyperplastic tuberculosis of caecum; carcinoma of colon; gall-stones; appendicular abscess; renal calculi; tuberculous glands; and actinomycosis. To these were added, after the first examination, "gall-stones passed through common bile duct but retained in ileum" and "calcified hydatid cyst."

X-Ray Examination.—Having committed ourselves to the above differential diagnosis the patient was submitted to the following *x*-ray examinations: (1) barium meal and enema, (2) cholecystography, (3) pyelography, performed in that order. The first report, on items (1) and (2), was: "Sixteen large 'ring' shadows in right iliac region; they are not in a dilated gall-bladder, as a normal dye-filled gall-bladder is shown. They appear to be a dilated terminal ileum, and are probably 'foreign bodies' which have been swallowed." The second report stated: "Kidneys normal and not related anatomically with the shadows."

Operation.—The diagnosis of the first report was tentatively agreed upon, and, since the patient still continued to have attacks of pain and asked for operative intervention, a laparotomy was performed by right paramedian incision. A loop of the ileum was found adherent and twisted upon itself. There were no signs of inflammation. Hard masses like "pebbles" were felt inside the loop of gut "as if in a bag" and made loud "clicking" sounds when handled. Fifteen of these were delivered through a small opening made in the wall of the ileum (the sixteenth could not be found), the opening in the ileum was sutured and the abdomen closed. Although the sixteenth "foreign body" was subsequently seen by *x* rays, the patient made an uneventful recovery and was returned to gaol free from these attacks of pain.

THE "FOREIGN BODIES"

The fifteen "foreign bodies" removed were all more or less spherical in shape, save one which was flat. They were heavy (average weight 2.66 grammes), resembled

pebbles of a greenish-brown colour, and were very smooth. The size is shown in the illustration. They were easily crushed, and were found to be laminated. The nucleus in each stone crushed was a fruit-stone with an average weight of 0.352 gramme.

Extract from the Analyst's Report.—"Analysis showed the powdered concretion to contain 3.9 per cent. moisture and 60 per cent. calcium oxalate, together with traces of calcium and magnesium phosphates. No carbonates and no ammonia were detected. Continuous extraction with ether in a Soxhlet apparatus yielded a substance consisting chiefly of fat, and amounted to 1.2 per cent. of the dried concretion. Qualitative tests on this extract showed the presence of cholesterol in very small amount."

CONCLUSION

It was concluded that the vague story of swallowing fruit-stones during childhood was correct, and that these fruit-stones, instead of passing normally through the intestinal tract, had been retained in a loop of the terminal ileum, where they formed the nucleus of the "stones" removed, having during the passage of years become encrusted with deposits of the oxalate and phosphate salts of calcium and magnesium and traces of cholesterol.

Our thanks are due to the Commissioner of Public Health and the Commissioner of Police for permission to publish this case; to Mr. L. H. Barton, who made the analysis of the "stones"; and to our Chinese medical colleagues for the able assistance which they gave in the treatment of the case.

J. E. BOWEN, M.B., B.Ch., D.P.H., D.M.R.E. (N.U.I.)
G. CHAMBERS, M.B., B.Ch., D.M.R.E.
W. R. JOHNSTON, M.D., B.Ch., D.P.H.
Shanghai.

A verbatim report of the proceedings of the twenty-third annual conference of the National Association for the Prevention of Tuberculosis, held at Bristol in July last, is now published. The subjects discussed at the conference were: (1) propaganda and publicity methods; (2) preventive institutions (with special reference to open-air schools); (3) equipment and activities of a tuberculosis dispensary. Addresses were also given on the inquiry into tuberculosis in the island of Cyprus. Copies of the transactions may be obtained from the Secretary-General, N.A.P.T., Tavistock House North, Tavistock Square, W.C.1; price 7s. 6d. each, post free.

Reviews

ELECTROCARDIOGRAPHY

Clinical Electrocardiography. By Sir Thomas Lewis, M.D., F.R.S., D.Sc., LL.D., F.R.C.P. Sixth edition. (Pp. 128; 109 figures.) London: Shaw and Sons, Ltd. 1937.

The Fundamentals of Electrocardiographic Interpretation. By J. Bailey Carter, M.D. (Pp. 326; 250 figures. 20s.) London: Baillière, Tindall and Cox. 1937.

It seems that few cardiologists escape the urge to write a textbook on electrocardiography. In fact there are too many such books, and too few readable and concise accounts of the clinical aspects of cardiovascular disease. It is true that no investigation of heart disease, known or suspected, is complete without electrocardiography, but there is a tendency for instrumental methods to be given too dominant a place among the means at the disposal of the clinician. One of the earliest and best brief accounts of electrocardiography was given by Sir Thomas Lewis, and the sixth edition of his *Clinical Electrocardiography* presents a useful outline of the method and of the interpretation of the curves obtained in the common disorders of the heart. In his section on coronary thrombosis the author emphasizes the importance of correlating the electrocardiogram with the other clinical evidence before arriving at a diagnosis.

Dr. J. Bailey Carter, in *The Fundamentals of Electrocardiographic Interpretation*, has produced a comprehensive survey of the subject. The earlier sections of the book give an account of the principles and technique of the method, and these are succeeded by orthodox accounts of the common abnormalities of rhythm. A discussion of the electrocardiographic aspects of myocardial disease makes reference to chest leads. The author has given a description of the curves likely to be obtained in certain forms of heart disease, such as congenital lesions and mitral disease, and in addition has mentioned the anomalies often seen in certain general disturbances of bodily function, such as myxoedema and diabetes, and in toxic conditions such as pneumonia and diphtheria. The 250 figures (mostly electrocardiograms) suitably illustrate the text, though the records themselves or the reproductions of them are not all of equally high standard. This is a valuable book in which a serious attempt has been made to present an up-to-date outline of electrocardiography in its true perspective and without elaboration of debatable matters.

ARCHIVES OF NEUROLOGY AND PSYCHIATRY

Archives of Neurology and Psychiatry from the Central Pathological Laboratory of the London County Hospitals for Nervous and Mental Disorders. Edited by Frederick L. Golla, M.B.Oxon., F.R.C.P. Volume XIII. 1937. London County Council. P. S. King and Son, Ltd.

It has sometimes been said that the administration of hospitals or laboratories by local authorities was likely to kill originality and discourage enterprise. The present volume is the best possible refutation of such a doctrine. In this Professor Golla has collected forty-eight papers dealing with various aspects of neurology and psychiatry which have emanated from the special institutions under the control of the London County Council. All these papers have been issued before in various publications and appear here without resetting and therefore in a variety of types and styles. It seems a pity that the typography could not have been made uniform. However, if the manner leaves something to be desired the matter is full of interest. There are studies of Berger's rhythm in cerebral tumours and in epilepsy, records of basal ganglia syndromes, and certain biochemical observations as well as studies on the effect of benzedrine, mescalin, evipan, and bromides on cerebral function. Papers on neurosyphilis are contributed as well as on encephalitis lethargica, polyneuritis, etc.

In the psychiatric section are several papers dealing with experimental psychology, while others are more purely clinical. An interesting genetic paper is contributed on dissimilarity of monozygotic twins, and there are a few papers on matters relating to mental deficiency. This is the thirteenth volume of the series, and as has been indicated above it is a tribute to the healthy activity of the scientific work carried out under the auspices of the London County Council.

NATIONAL EDUCATION

The Silent Social Revolution. An Account of the Expansion of Public Education in England and Wales, 1895–1935. By G. A. N. Lowndes. (Pp. 274; 14 illustrations. 2s. net.) London: Humphrey Milford, Oxford University Press. 1937.

Not so very long ago the National Union of Teachers issued a remarkable publication entitled *The Schools at Work*. With very little letterpress but with abundant pictorial illustration it set out in a very vivid and at times pathetic way what our schools are now doing and the contrast between all this and the state of things forty to fifty years ago. We now have in *The Silent Social Revolution*, by Mr. G. A. N. Lowndes, an equally remarkable volume, to which the earlier publication may be regarded as an introduction, but to which it might well have been an addendum, giving a relatively full and detailed account of "The Expansion of Public Education in England and Wales, 1895–1935." The author states that existing literature bearing upon this subject seems to him "to be duller than the intrinsic interest of the subject warrants," and most readers will agree with him. They will the more gladly welcome this comprehensive, accurate, orderly, well-written, and restrainedly humorous "account." It is an account in two senses: historical and, being so well done, therefore strongly illuminative; and economic, balancing the gains and the cost of a vast social change. In the former aspect worthy tribute is paid to those whose names should never be forgotten in this connexion, particularly Sir John Gorst, Sir Michael Sadler, Mr. A. J. Balfour (as he then was), and Sir Robert Morant. In the latter aspect it is said: "Whatever may be the ultimate verdict of the social historian of the future upon the efforts made by successive British Governments, in co-operation with the local authorities, to repair in three decades the neglect of three centuries, this much is certain, that their efforts have quite outstripped the capacity of the man in the street to keep abreast of what has been happening"; and again, "Although most people will readily assent to the dictum that educational expenditure is long-range expenditure, few are qualified to prove its truth by showing what the long-range expenditure incurred by past generations has achieved."

A widespread ignorance or indifference as to education still prevails in several sections of the population, and each year there are still voluminous and verbose aspersions on the value and methods of our modern schools. Constructive criticism and suggestions are always valuable, but judgments made without any real knowledge or understanding of what is actually being done are of no use. The present volume sets out more completely and

accurately than any other known to the reviewer the case for public education: it supplies abundant material—historical, social, and statistical—for those who wish to make an intelligent assessment in this sphere, or who would like to be helped and encouraged in their presentation of the case to any public which remains sceptical. As has often been said in this *Journal*, education and health are not subjects which are really separable, but many of our readers will be particularly interested in what is said of the school medical service. They will find that the author says with regard to this: "One wonders if any nation has ever spent £2,000,000 a year to better advantage," and that full justice is done to the work of Sir George Newman. There may, however, be a little regret that the author has failed to note the decisive influence of the British Medical Association upon both the initiation and progress of this service. It may be worth pointing out that in the particular copy of the book sent for review pages 177 to 192 are reduplicated. This oversight—or lack of oversight—is embarrassing; but it may not have occurred in other copies.

EXPERIMENTAL PHARMACOLOGY

Handbuch der Experimentellen Pharmakologie. By A. Heffter. Vol. V. Edited by W. Heubner and J. Schüller. (Pp. 307; 24 figures. RM. 39.60.) Berlin: Julius Springer. 1937.

The fifth supplementary volume of Heffter's textbook of experimental pharmacology contains the following articles: chaulmoogra oil, by Professor Schlossberger of Berlin; coramine and cardiazol, by Professor Hildebrandt of Giessen; the harmine alkaloids, by Professor J. A. Gunn of Oxford; insulin, by Professor Geiling of Chicago and Drs. Jensen and Farrar. The articles on coramine and cardiazol are of particular interest, since these drugs have attained great clinical popularity. The experimental work reviewed shows that there is little evidence for any direct cardiac action. The author gives a full review of the extensive literature regarding the stimulant action of these drugs on the central nervous system.

The article on insulin by Geiling and his co-workers gives a very clear summary of the experimental evidence, and the authors deal fully with various difficult problems, such as the factors regulating insulin secretion, the manner in which insulin acts on the blood sugar, and the influence of the pituitary gland on the secretion and action of insulin. The speed and success with which the therapeutic use of insulin has been developed form a striking contrast to the difficulties which have attended the analysis of its physiological action. Professor Schlossberger's article on chaulmoogra oil and related compounds gives a summary of the recent chemical and pharmacological literature relating to fatty acids which contain cyclic groups. The very large literature quoted shows that a surprisingly large amount of work has been done on this subject during the last decade. Professor Gunn, in his article on the harmine group, gives a brief account of the very varied pharmacological actions of members of this group.

TUBERCULOSIS OF THE ALIMENTARY TRACT

Tuberculose du Tube Digestif. By André Cadé, Paul Santy, and Jean Heitz. (Pp. 410; 27 figures. 85 fr.) Paris: Gaston Doin et Cie. 1937.

This work serves as a reminder of the possible existence of tuberculous lesions in every part of the alimentary tract (infinitely rarer in some situations than in others), and of the fact that tuberculosis may involve organs, such as the appendix, without producing the typical histological changes. It attracts attention, too, to the frequency with which simple inflammatory and nervous derangements of the digestive system are associated with tuberculous disease elsewhere; thus dyspepsia is one of the commonest symptoms of phthisis. The body of the book is divided into four parts. In the first are discussed the various aspects of tuberculosis of the buccal cavity, including the tongue, the gums, the mucosa of the cheeks, the palate, and the lips; and the second surveys tuberculosis of the oesophagus. The part describing tuberculosis of the stomach contains also discussions on the relation of simple ulcer to tuberculosis and on the dyspepsias and forms of gastritis associated with tuberculosis of other organs. The fourth section, on tuberculosis of the intestines, deals separately with the generalized form and the forms localized to the small intestine, the ileo-caecal region, the appendix, the colon, the rectum, and the anal and perianal regions.

The book is written in textbook style, more adapted to the student than to the practising physician or surgeon, who will find the volume of little assistance in clinical work. The contents are not quite up to date, as is exemplified by the treatment of tuberculous enteritis; and the illustrations are inadequate in relation to the subject-matter, though a word of praise must be given to the four excellently reproduced *x*-ray photographs of tuberculous enterocolitis. The work will, however, be found very useful for purposes of consultation, particularly as there is an appendix which contains over a thousand references classified according to subject.

DUKE-ELDER'S OPHTHALMOLOGY

Text-Book of Ophthalmology. Volume II. Clinical Methods of Examination, Congenital and Developmental Anomalies, General Pathological and Therapeutic Considerations, Diseases of the Outer Eye. By Sir W. Stewart Duke-Elder, D.Sc., Ph.D., M.D., F.R.C.S. (Pp. 2094; 742 illustrations, including 24 coloured plates. 63s. net.) London: Henry Kimpton. 1938.

The second volume of Sir Stewart Duke-Elder's *Text-Book of Ophthalmology* will be received with interest and critical appreciation by all English-speaking ophthalmologists. In reviewing the first volume, which was published in 1935, we wrote:

"This first volume is in our judgment a great book. It is great by reason of its bulk, for it exceeds a thousand pages; it is great in its conception, and also great in its achievement. The author may well be congratulated upon such a piece of work—upon his ability to produce it and his industry in producing it. The standard he has set himself in this first volume, which deals with matters which have been particularly the subjects of his study, will make this succeeding task—that of embracing the many-sided aspects of clinical ophthalmology—difficult indeed, and the more meritorious will be his achievement if he wins through. In that event we may say with assurance that there will be no work on ophthalmology in the English language to match it."

This second volume is fully up to the high standard set by the first, and wholly justifies the interest and expectation aroused in the author's work. It accounts for another thousand pages, yet there is no inflation of material, but rather there is shown a real economy of words. The size is dictated by the subject-matter, for the book aims to be encyclopaedic. For an individual worker, in the full practice of his profession, to have produced two such volumes is a great achievement.

The second volume comprises four sections: the clinical methods of examination of the eye; congenital and developmental anomalies; general pathological and thera-

peutic considerations of diseases of the eye; and diseases of the outer coats of the eye. In the first of these the reader is conducted as it were through a complete examination of the eye by the simplest and oldest methods to the elaboration of these which new instruments and new methods of illumination and magnification have given to us. The balance of emphasis is admirably maintained, and the clearness of exposition is perfect. The second section is one that is a first-class test of the judgment of the author. Congenital and developmental anomalies are almost as many as the sands of the sea. Every one of them has some point of interest. A mere collection of such anomalies may exhibit the chaotic fascination of the junk shop of the antique dealer. But the wise collector will so marshal his exhibits as to display the trend of development in such a fashion as to be instructive in the highest degree. This the author has done. In the more clinical sections the handling of the diseases of the cornea is of great merit in its completeness and its suggestiveness. To each of these sections and to their subdivisions there is a well-selected bibliography.

The author has continued that very human feature of his first volume, the reproduction of the portraits of some of the masters of ophthalmology for whose work both ophthalmologists and their patients are daily debtors, and it is interesting to find that the portrait of Treacher Collins faces the introduction to congenital anomalies. We are sure that this second volume will receive as warm and appreciative a welcome as the first, and that in this welcome the author will find an encouragement to proceed with all speed to the issue of the third and final volume. It is scarcely necessary to add that the work of the printer, both in the text and in the illustrations, is of the highest order.

Notes on Books

Dr. BRONSON CROTHERS is well known as a paediatrician with a special interest in neurology, which naturally brings him up against the difficult question of behaviour problems of children in and out of hospital. *A Pediatrician in Search of Mental Hygiene* (Humphrey Milford, 8s. 6d.) is chiefly concerned with the difficulties of liaison between child guidance units and children's hospitals in America, where it sometimes appears from the literature that there is a good deal of rigidity and want of tolerance of each other on the part of the various specialists concerned, though this is probably more obvious in theory than in practice. That difficulties exist there can be no doubt, and they are as real in this country as anywhere else, and therefore all those concerned will gain much from a study of this book, in which the differences in outlook of the paediatrician and the psychiatrist are freely discussed. Further problems, such as the small number of psychiatrists interested in children and the difficulty of fitting the psychologist and psychiatric social worker of the child guidance team into a hospital unit, are dealt with. Finally Dr. Crothers describes a co-operative unit modified from the child guidance plan which has been set up in the Boston Children's Hospital to deal with problems of behaviour and adjustment in the hospital's clientele.

We have received a copy of the *Periodica Medica* (Leipzig, Georg Thieme, RM. 3), which, as its subtitle states, contains a list and abbreviations of the most important journals of medicine and the allied sciences. The work, which is now in its third edition, has been compiled by Generaloberarzt Dr. Max Kuntze of Berlin and edited by Professor Kurt Klare Scheidegg, and contains 3,449 entries.

Preparations and Appliances

AN AID IN THE TREATMENT OF VARICOSE ULCER

Dr. JOHN FRANKLIN (London, W.1) writes:

Edward Taylor Ltd. prepared for me at my suggestion last year circular pads of sponge rubber half an inch thick and three inches in diameter coated with the same plaster mass that is used on "flexoplast" elastic adhesive bandages. I have found that the healing time of varicose ulcers has been shortened very considerably by the application of one of these pads to the surface of the ulcer before putting on the elastic adhesive bandage. Where the area of ulceration is more extensive than three inches in diameter, pads of the requisite size and shape may be cut out of large sheets of the material. The pad and elastic bandage is changed every one, two, or three weeks, following the usual technique employed in treating varicose ulcer with elastic adhesive bandages.

TWO OINTMENTS

"Desitin" ointment (Desitin Products Ltd., Park Royal Road, N.W.10) is compounded with vaseline, lanolin, and cod-liver oil, and also contains zinc oxide and talc. The vendors quote numerous favourable references from medical literature regarding the wound-healing action of the ointment.

"Esiderm," made by the same firm, is a non-greasy ointment which is compounded with glycerin and water, and contains zinc oxide, talc, and Kieselguhr.

LIVER EXTRACT FOR PARENTERAL USE

"Reticulogen" (Eli Lilly and Co.) is a liver extract for parenteral injection, combined with vitamin B_1. Each ampoule (0.5 c.cm.) contains the haematopoietic equivalent of nearly 10 lb. of fresh liver and, in addition, 500 international units of vitamin B_1. The manufacturers supply an interesting pamphlet in which they recount the remarkable therapeutic success of parenteral liver therapy, and mention that during the past decade the mortality due to pernicious anaemia has fallen by 60 per cent. The disorders of the central and peripheral nervous system in pernicious anaemia have proved more refractory to treatment than have the blood changes. Various authorities have advocated the use of vitamin B_1 for the relief of the nervous disorders, and for this reason that vitamin has been included in the preparation.

A NEW LOCAL ANAESTHETIC

"Metycaine" (Eli Lilly and Co.) is a new local anaesthetic, the chemical name of which is gamma-(2-methyl-piperidino)-propyl benzoate hydrochloride. The toxicity of this compound by subcutaneous injection is similar to that of procaine, and therefore much less than that of cocaine; when administered intravenously, however, it is more toxic than procaine. Metycaine is superior to procaine, as it can penetrate mucous membranes, and hence is useful for ophthalmic, oral, nasal, and urogenital application. It can be used for hypodermic administration in the same manner as procaine. The makers recommend it for spinal anaesthesia, and state that its action is more enduring than that of procaine. It is supplied for spinal anaesthesia in a 10 per cent. solution, and the dose required lies between 40 mg. and 200 mg. of the drug, or 0.4 c.cm. and 2 c.cm. of the solution.

SULPHONAMIDE EMULSION

Emulsion of sulphonamide (Wyleys Ltd., Coventry) is a palatable preparation containing 7½ grains (0.5 gramme) of pure *p*-aminobenzenesulphonamide in each fluid drachm (4 c.cm.). The drug is present as a fine powder suspended in water, and the mixture contains nothing in addition except a simple emulsifying agent. The oral administration of sulphonamide has become established as an effective method of treatment of disease due to infection with haemolytic streptococci (acute puerperal sepsis, erysipelas, tonsillitis, etc.), and its action in numerous other forms of infection is being investigated intensively. Emulsion of sulphonamide provides a convenient and agreeable method for the administration of this important drug.

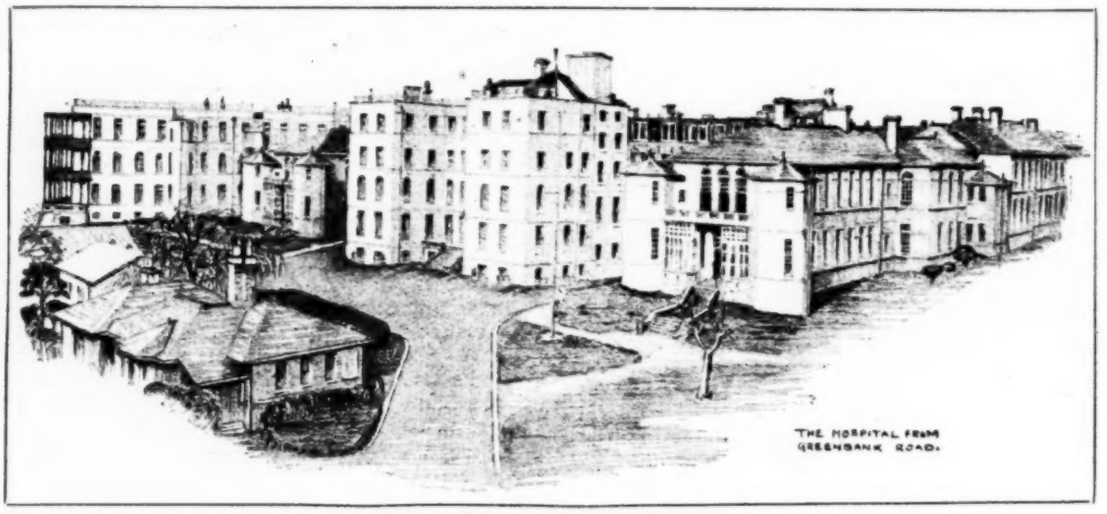
ONE HUNDRED AND SIXTH ANNUAL MEETING
OF THE
BRITISH MEDICAL ASSOCIATION
PLYMOUTH, 1938

THE one hundred and sixth Annual Meeting of the British Medical Association will be held at Plymouth next summer under the presidency of Dr. Colin D. Lindsay, emeritus physician to the Prince of Wales's Hospital, Plymouth. The Sectional Meetings for scientific and clinical work will be held on Wednesday, Thursday, and Friday, July 20, 21, and 22, the morning sessions being given up to discussions and the reading of papers. The Annual Representative Meeting for the transaction of medico-political business will begin on the previous Friday, July 15. The full list of presidents, vice-presidents, and honorary secretaries of the seventeen Scientific Sections was printed in the *Supplement* of February 5. Other details of the arrangements for the Annual Meeting will be given in subsequent issues. We publish below the second of a series of descriptive and historical articles on Plymouth and its medical institutions. The first article appeared in the *British Medical Journal* of January 1 (p. 32).

THE HOSPITALS OF PLYMOUTH

> "How many desolate creatures on the earth
> Have learnt the simple dues of fellowship
> And social comfort in a hospital,
> As Marion did! She lay there, stunn'd, half trained,
> And wished at intervals of growing sense,
> She might be sicker yet, if sickness made
> The world so marvellous kind, the air so hushed,
> And all her wake time quiet as a sleep."

The manner in which the medical profession in Plymouth have paid "the simple dues of fellowship," as Elizabeth Barrett Browning so beautifully put it, to their suffering fellow men and women illuminates some of the nobler pages of the city's long and outstanding history. The task has not been easy, for although, generation after generation, leading physicians and surgeons have willingly given of their time and skill in the art of healing, the institutions where they have laboured, relying for their existence upon voluntary financial support, have too often been faced with the handicap of debt. This remains true, even more so, to-day. But that has never daunted those upon whom the responsibility for the management has rested from exercising a faith which has reflected itself in a progressive policy, the result being that the hospitals of Plymouth are among the best-equipped in the country.



Prince of Wales's Hospital, Plymouth.

The Prince of Wales's Hospital

Until recently there were three main hospitals, the largest being the South Devon and East Cornwall, the Royal Albert, and the Homoeopathic, but under a recent charter these have been amalgamated and are now known as the Prince of Wales's Hospital. Under this merger the available number of beds is 374. In the year ended December 31, 1936, the number of people who received treatment was nearly 22,000, and over 320 beds were occupied daily. The medical, nursing, technical, and supporting staffs total 354. The daily food bill is £30, and the wages absorb £21,000 per annum. The number of motor accidents treated in 1936 was 355. These figures give some idea of the activities of the hospital. Maybe they are small compared with similar institutions in the larger centres; but Plymouth's population is not much over 200,000, so it will be realized that the service is adequate. Unfortunately the hospital is under a severe financial handicap, the present deficit in running it being nearly £30,000, in addition to which there are liabilities in respect of the building fund and other contingencies.

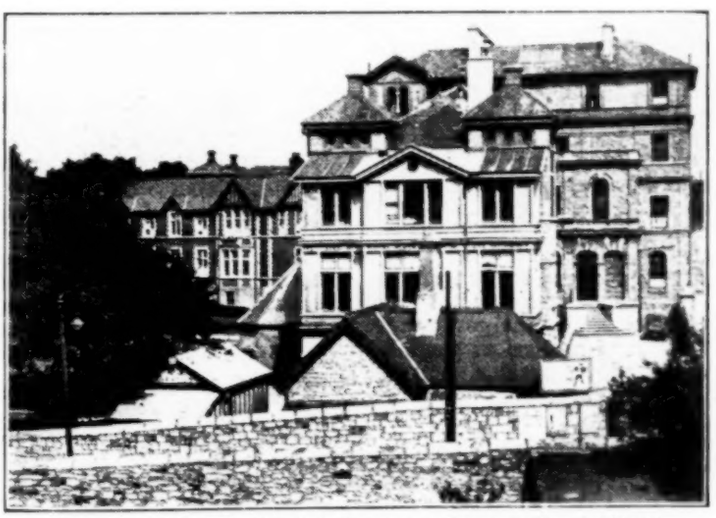
What was formerly the South Devon and East Cornwall Hospital was established in 1840, when the population of Plymouth was 35,000. The cost of the building, which was then in Sussex Place, was £4,400, this sum being raised by voluntary contributions. There was at that time accommodation for twelve patients, and at the first annual meeting it was reported that twenty patients had been received. In due course the number of beds was increased, until in 1847 there were forty-two. Through the generosity of the Earl of Mount Edgcumbe wards were set apart for patients who were able to pay for their own maintenance, which was then apparently 10s. a week. In 1852 a new wing, erected at a cost of £1,050, gave an

additional twenty beds. As a memorial to Prince Albert the Royal Albert wing was added in 1862, the cost being £2,900; and six years later a children's ward of twelve beds was provided.

Less than forty years after the hospital had been opened the governors came to the conclusion that in consequence of serious structural defects a new one was desirable. Accordingly they bought the site of the present imposing buildings for £5,000, and in 1881 erection was begun. Altogether the hospital cost over £38,000, practically the whole of this sum being raised locally. Many substantial bequests were made. Mrs. Haines gave nearly £30,000 for, among other things, the erection of a wing in memory of her brother, John Hay. The gifts of Sir Massey Lopes of Maristow, near Plymouth, amounted to something like £20,000, and two medical wards endowed by him are known as Lopes and Maristow. It is interesting to note that Henry Lopes, a son of Sir Massey, is now the president of the hospital. The names of other benefactors are recalled in the various wards: Mount Edgcumbe, Rooker, Gill, Prance, Radford, Bewes, Dawson. To commemorate Queen Victoria's Diamond Jubilee, friends of the hospital gave £1,148 for the maintenance of unendowed beds in the John Hay wing. As an indication of the hospital's increasing usefulness it may be pointed out that in 1900 in-patients totalled 1,483, and the daily number of occupied beds 135, with an average stay of thirty-six days at a cost of 3s. 11¼d. a day, the operations numbering 620; and out-patients 2,599, with 366 operations.

In 1898 the physicians and surgeons formed themselves into a Medical Board to consider questions submitted to them by the committee of management. Other developments included in 1912 an enlarged theatre block dedicated by the Bishop of Exeter in memory of Dr. Connell Whipple. The cost was met by friends, who contributed £400. Four years later a mortuary chapel was completed, and in 1918 buildings were erected for the treatment of venereal diseases, the cost being defrayed by the Devon County Council, Cornwall County Council, and Plymouth City Council. In the following year the Mildmay hut was presented for pensioners requiring orthopaedic treatment, and subsequently a similar hut for convalescent patients was given by the staff of the Territorial Hospital, then established at Salisbury Road schools. A sum of £2,500 was voted by the British Red Cross Society for sleeping quarters for the nursing staff, and £6,000 was received from the National Relief Fund.

Men's Ward, Orthopaedic Hospital, Mount Gold, Plymouth.
(Block lent by Messrs. Ed. J. Burrow and Co., Ltd., Cheltenham and London.)



The Prince of Wales's Hospital, Devonport (formerly Royal Albert).
(Photo, Abrahams, Devonport.)

To keep abreast of the times, a massage and electro-therapeutic department and a new building for pathological work were provided, deep-therapy plant installed, and an ultra-violet-ray lamp added to the electrical department. In 1928 Princess Mary, Viscountess Lascelles, laid the foundation stone of a new block, which was not opened until January 8, 1936. This extension cost £20,000, towards which £9,000 was allocated from the proceeds of a fair and fête attended by the Duke of Windsor, then Prince of Wales and Lord High Steward of the city. This ambitious effort, the largest of its kind organized in Plymouth, realized nearly £15,000. Provision has been made for paying patients, and a scheme whereby persons in receipt of incomes below a certain limit are

assured of free maintenance and treatment by paying contributions equal to a penny for every pound earned in wages produces well over £20,000 yearly—a sum which, incidentally, represents the hospital's annual wages bill. The amalgamation of the Ear and Throat Hospital with the main hospital enabled the Governors to utilize that building as a nurses' home. Eleven years ago Mr. Arthur R. Cash, from the Norfolk and Norwich Hospital, was appointed general superintendent and secretary, and he has rendered, and continues to render, conspicuous service.

It was in 1934 that unification of the hospitals became an accomplished fact. Such a step has been fully justified, enabling the Governors the more efficiently to meet the public needs so far as the financial resources of the hospital permit. The Board of Management was fortunate in securing as its first chairman Dr. R. H. Wagner, who for many years was one of the leading practitioners of the city. Dr. Wagner still fills that responsible and arduous position, bringing to bear upon it not only wide medical experience but business acumen combined with a mind of catholic culture.

The hospital is recognized by the Conjoint Board, and medical students studying there are entitled to have the portion of the time so spent treated as the equivalent of passing a like period in a London hospital. In addition to the nurses' homes training schools are maintained. Working in conjunction with the hospital are the Pearn Convalescent Home, provided and endowed many years ago by a gentleman bearing that name, and another Home at Crownhill, near Plymouth, which is used as a recovery Home.

Dr. Colin D. Lindsay, President-Elect of the British Medical Association, retired from the post of senior honorary physician in May of last year, "after a long and honourable association with the hospital." To quote from the last annual report: "He was appointed honorary assistant physician to the South Devon and East Cornwall Hospital in January, 1913, reaching the senior staff in April, 1926. During twenty-four years he has rendered service of a high order, carrying out the duties of his office skilfully and ungrudgingly."

The Lockyer Street Section of the Prince of Wales's Hospital was originally the Homoeopathic Hospital, the inception of which was due to Dr. Field, who came to Plymouth in 1870 and opened a dispensary. A gift of £1,000 enabled a house in Union Street to be purchased, and it was opened for the reception of ten patients in 1884. Subsequently a house in Lockyer Street was purchased, and the hospital was transferred there in 1893, under the name of the Devon and Cornwall Homoeopathic Dispensary and Cottage Hospital. After a lapse of years the adjoining house was acquired and added to the institution, which five years earlier had changed its name to the Central Hospital, it having been decided by the governing body to provide general and universal medical as well as homoeopathic treatment. A well-known medical practitioner, Dr. Wilmot, was elected honorary physician in 1902. He served for twenty-three years, and on retirement became honorary consulting physician. Dr. Wilmot was president of the British Homoeopathic Congress when it met in Plymouth in 1930.

The Devonport Section of the Prince of Wales's Hospital was for many years the Royal Albert Hospital. It evolved from the Dock (Devonport's old name) and Stonehouse Public Dispensary, which, established in 1815, functioned for over half a century. The hospital was projected by Thomas Woollcombe, Joseph May, and Alfred Norman (the last-named prepared the plans), Miss Florence Nightingale being responsible for the arrangement of the wards. The memorial stone was laid in 1862 by the Earl of Mount Edgcumbe with impressive Masonic ceremony. The Government granted £3,500 towards "lock wards," then first instituted for the treatment of "certain women," and these functioned till, as the result of general agitation and after fierce controversy, the policy came to an end. The hospital, situated near the naval dockyards, has received good support from the men employed there. In the year before amalgamation sixty-one beds were available and the average number of patients resident daily was fifty; during the twelve months 988 in-patients were admitted, out-patients numbered 5,588, and total attendances were 36,000.

The Royal Eye Infirmary

Like the other hospitals the Royal Eye Infirmary had a small beginning and owed its inception to one who, impelled by what has aptly been termed the "civic spirit," wished to do something to alleviate suffering. This gentleman, Dr. John Butler, specialized in the treatment of the eyes, and after consulting medical men in London and several provincial centres opened a dispensary in 1822. The demands upon it were such that developments became imperative and larger premises were acquired in Millbay Road. On the site to-day stands a large hotel. In 1828 the name was changed to the Royal Plymouth Eye Infirmary, the Duke of Clarence (later King William IV) having become patron. For thirty-two years Dr. Butler treated sufferers, and it is computed that he cured or relieved over 30,000 persons. To mark his benevolence he was presented with a silver salver and a portrait of himself in 1854.

In commemoration of Queen Victoria's Diamond Jubilee a fund was inaugurated, and as a result the present spacious hospital, equipped to-day on the most modern lines, was erected at Mutley at a cost of £15,000. It is stated that up to the eve of its removal to Mutley about 80,000 persons had been treated at the Infirmary. In its last annual report the committee recorded that during the year the number of new patients who received treatment was 3,649, the number of attendances 11,591, and the number of operations performed 618. This was the second successive year that the figures exceeded those recorded for any other year since the foundation of the institution. The balance-sheet showed a healthy state of affairs, income being in excess of expenditure by £1,045. It is worth pointing out that the institution has some sound investments, dividends on which totalled just over £1,000.

Municipal Hospitals

Since the passage of the Act of 1929 the Plymouth City Council has established a Municipal Hospital, which is rapidly developing into a very important institution for the treatment of acute as well as chronic disease. The main hospital is situated at Greenbank, and consists of acute medical and surgical wards and wards for chronic diseases. A maternity block is projected, and other extensive additions are in the programme of the City Council. A new nurses' home was added recently, and is a very good example of what can be done in this respect.

On the site of the old isolation hospital in Mount Gold a modern and extremely well-equipped Orthopaedic Hospital has been erected, the buildings being on the single-floor system. In the same grounds are sited the wards for cases of acute pulmonary tuberculosis. The more chronic type is dealt with through the tuberculosis dispensary at Beaumont House and at the council's sanatorium at Didworthy, which is beautifully situated in the Avon valley. The Infectious Diseases Hospital stands in grounds at Swilly, in the neighbourhood of the council's housing estate; while at Blackadon, near Ivybridge, the council maintains a very fine Mental Hospital, with which are associated several farms for the employment of suitable types of patients. A new block for private and voluntary patients has recently been added to this. This hospital also is delightfully situated on a height, and commands one of the lovely views so characteristic of the scenery of Devon.

The hospitals of the council are staffed in part by whole-time medical officers under the direction of the medical officer of health, and in part by part-time consultants, who are otherwise engaged in active practice in the city.

Plymouth Public Dispensary

The Plymouth Public Dispensary is 140 years old, work there having begun in 1798 at the Mayoralty House in Woolster Street, the dispensary being removed three months later to other quarters. It was in 1804 that a garden in Catherine Street was bought, and the present building was in due course erected on the site. The originator of the dispensary was Mr. Charles Younge, an eminent medical man, who left it £1,000 in 1807. An excellent portrait of this worthy by Northcote hangs in the Governors' room. It may be said that the South Devon and East Cornwall Hospital was an offshoot of this institution, and at one time the possibility of a union between the two was considered. Nothing came of the project, however, and the dispensary continues its beneficent work, the number of patients in the year ended September last being over 3,300, with total attendances of nearly 12,000.

Some records of the dispensary provide curious reading these days. For instance, the committee decided in 1799 that the medical officer be empowered to "order wine and porter occasionally for the patients," and two years later came to the conclusion that it was very desirable to extend the benefit of cow-pox inoculation, "which is now generally acknowledged to be a safe and effectual prevention of small-pox," to the poor. At a later date the committee held a special meeting to consider the expediency of taking some specific steps towards obtaining apparatus for dealing with suspended animation; further, it was only after ascertaining that the dispensary pump was beyond repair that the "town water was brought in." In 1832 the following committee minute is recorded: "A serious affection of the stomach and bowels be prevalent in the town and that, regarding it as a probable precursor of a more malignant disease, they had deemed it necessary to provide for such applications for medical aid from the dispensary without waiting for formal admission by ticket." A little later cholera broke out, and the dispenser was paid a guinea for additional work during the epidemic, the duration of which, however, is not stated. In 1800 it was considered "highly expedient that the establishment of this excellent institution should be annually commemorated by attending Divine service." Subscribers were accordingly invited to St. Andrew's Church for that purpose, an annual custom that prevailed for many years.

Money came from all sources. The Guardians of the Poor paid their first subscription of twelve guineas in 1809. Various sums from the Mayor represented fines, though upon whom imposed and for what offence there is no enlightenment; but one gentleman sent five guineas he had won as a bet because he regarded this to be "a weak method of supporting an argument." The dispensary also received a similar sum forfeited by two men "who had improperly secreted an anchor they had weighed"; and £1 came as a "part of an acknowledgment for improper conduct," the Mayor again being the medium for passing on the money. Mr. Toll's chimney caused a spot of bother. It fell and damaged the dispensary, leading to "sundry repairs," the cost of which was defrayed by the committee, the unfortunate Toll "being insolvent and unable to pay for the same."

In 1821 the facsimile of an instrument invented in Edinburgh and used there for extracting a double-barbed fish-hook from a youth's throat was "gratefully received." Leeches were apparently used in the treatment of patients, for another minute requests the medical officer "to give written orders, duly signed, for the supply of leeches, and that no leeches be paid for unless the order of the medical officer is produced."

The Plymouth Medical Society

The Plymouth Medical Society is one of the oldest in the provinces, having been inaugurated as far back as 1794. It is still very active. Originally the idea was presumably a close corporation, for the first rule laid down that it should "consist of no more than fifteen members, who are to meet on the Friday close to every full moon at 7 o'clock in the evening at the home of one of the members in rotation, where all business relative to the society shall be transacted." Of the two founders, Dr Remmett and Samuel Fuge, the former was president till his death in 1828, and also the first honorary treasurer, secretary, and librarian. Truly he earned the title of "Father of the Society." In 1817 extraordinary members to the number of twelve were admitted as associates, but in 1826 members were unlimited. A reconstruction of the society followed in 1869 which, among other changes, made no distinction between members. Among the many distinguished members was Dr. Cookworthy—nephew of Cookworthy, of Plymouth china fame—who was secretary and treasurer for a long period. The society continues with even greater vigour its educational work for the profession, and possesses a valuable library at its headquarters in Beaumont House.

CONTROL OF RABIES IN PALESTINE

A feature of the annual report for 1936 of the Department of Health, Palestine, is the inclusion of three maps, showing respectively the Public Health Administrative Divisions, the incidence of hookworm as shown by the 1932–5 survey, and the stations of the Public Health Laboratory and Anti-Rabic Service.

Rabies constitutes a problem of considerable importance in Palestine. Anti-rabic vaccine, a modification of Semple's carbolized killed virus, has been manufactured at the Department's Central Institute in Jerusalem since 1923. By a wise policy of decentralization treatment is made readily available throughout the country, and no fewer than thirty-eight provincial health offices are supplied with adequate issues of vaccine. During the year under review 1,350 persons attended for specific treatment, and of these 1,280, or more than 94 per cent., reported within four days of being bitten. It is thus evident that the facilities for anti-rabic treatment are regarded with confidence and enthusiasm by the populace. Of the 1,350 who received treatment only one died of hydrophobia. The victim was a Palestinian Arab boy, aged 4, who was severely bitten in the right arm by a dog which ran away. Specific treatment was begun on the following day. Symptoms of hydrophobia developed thirty-three days after the bite, and nineteen after completion of treatment. Death occurred four days later. It is noteworthy that another child was bitten by the same dog on the same day; in this case the course of treatment was successful. Among untreated persons there were two deaths from hydrophobia. One case was a young Rumanian Jew, aged 16, who was slightly bitten on the hand by a dog in Oradia, Rumania, four months before he arrived in Palestine. The period of incubation was 241 days, the duration of the disease three days. The other case was a Palestinian Arab, a villager aged 35. He was bitten severely on the face by an unknown animal, possibly a jackal. Symptoms developed thirteen days later, and the sufferer died on the following day.

The importance of rabies control in Palestine is demonstrated by a table showing the number of animals destroyed during the year. The total figures are: dogs, 10,608; cats, 1,346; wild animals, mostly jackals and foxes, 1,301. The dog has been chiefly incriminated in the dissemination of rabies. Of eighty-seven cases of rabies notified, sixty occurred in dogs and eleven in cats. Of the 1,350 persons receiving treatment, 910 were bitten by dogs. Cats were incriminated to the number of 123, jackals 45, and ruminants 48; other animals included the fox, the mongoose, the rat, and the mouse.

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THE MECHANISM OF THE NEW CHEMOTHERAPY

The enormous expansion of chemotherapy in bacterial infections now being witnessed is proceeding largely on empirical lines. It is true that curative experiments in animals justify much of it, but these experiments are themselves empirical, and no one can yet begin to explain why quite closely related bacteria such as haemolytic and non-haemolytic streptococci exhibit widely different degrees of susceptibility, or how among the many new compounds now being synthesized slight differences in chemical structure so profoundly affect therapeutic activity. The number of these compounds is constantly expanding; so also is that of the infections in which they are said to be useful. Experimental work by Rich and Fillis[1] of the Johns Hopkins Medical School shows that sulphanilamide can exert a "striking inhibitory effect" on the development of tuberculosis in the guinea-pig. Two recent publications, though unimpressive in the weight of their evidence, are portentous if they are to be accorded any significance at all. According to de Léon[2] prontosil will cure malaria, and Rosenthal, Wooley, and Bauer[3] have demonstrated a protective action by this drug against lymphocytic chorio-meningitis in mice, though they also record negative results in protection tests against the viruses of influenza and the St. Louis type of encephalitis. If to a number of bacterial infections we are now to add virus diseases and protozoal infections as profitable subjects of therapeutic study, the amount and complexity of the work yet to be done if present methods have to be followed defy the imagination.

It is almost a relief to turn from this welter of therapeutic experiment to a reconsideration of first principles. Two important recent papers have reverted to the original problem of how prontosil acts on streptococci in the body; if this question could be fully answered it might well afford an insight into the wider problem and provide methods of attacking it which would shorten its investigation by years. Belief on this specific question has passed through two stages, and may now perhaps be said to be entering upon a third. The first was purely agnostic. Prontosil had been found to cure mice infected with haemolytic streptococci, and this action was providentially paralleled in the human patient. The drug was almost without any demonstrable antiseptic action *in vitro*; therefore its effect in the body must be exerted indirectly by some unknown mechanism. The second stage was ushered in by the assertion of Tréfouel, Nitti, and Bovet that prontosil is broken down in the body, liberating the substance we now know as sulphanilamide. The work of Colebrook, Buttle, and others in England then showed that sulphanilamide, in contrast to prontosil, is bactericidal even in extreme dilution for small numbers of streptococci, and since in the average case of septicaemia the numbers of cocci in the blood are small it was reasonable to suppose that they were directly destroyed in the infected body. These observations led to the partial abandonment of prontosil and the substitution of sulphanilamide in therapeutics, as well as to a wide exploration of the possibilities of other related compounds. This simple explanation has never been universally accepted, and the objections to it are now marshalled by Domagk himself[4] in a general review of the work which his discovery initiated.

Domagk does not believe either that prontosil is inactive in the body until it is split up or that its effect is simply that of an antiseptic. Of several reasons which he gives two carry more weight than the rest: the fact that the destruction of streptococci by sulphanilamide *in vivo* is more efficient in blood than in lifeless media, arguing that phagocytosis plays an essential part; and the discrepancy among different compounds of this nature between activity *in vitro* and *in vivo*, some which are highly antiseptic in the test tube being therapeutically valueless. As a further reason he adduces the variability of effect in different animals: if a certain concentration in the body fluids is all that is needed simply to kill bacteria, why should this in some cases bring about a cure in rabbits and not in mice? Domagk seems to have no very positive substitute to offer for what we may call the English hypothesis, but his attitude is broadly that prontosil makes streptococci susceptible to attack by the normal bodily defences; the appearance of degenerate cocci in treated animals is held, not very convincingly, to indicate some change rendering them vulnerable. The second contribution to this problem is that of Levaditi,[5] whose

[1] *Johns Hopk. Hosp. Bull.*, 1938, **62**, 77.
[2] *Publ. Hlth. Rep.*, Wash., 1937, **52**, 1460.
[3] Ibid., p. 1211.
[4] *Z. klin. Med.*, 1937, **132**, 775.
[5] *Monographies de l'Institut Alfred Fournier*, No. 5, Paris, 1937.

earlier studies on the subject are numerous. He will be remembered as the author of the idea that prontosil acts on streptococci by decapsulating them and of experiments that were said to show that it neutralizes streptococcal toxins. Levaditi now seems chiefly concerned to prove that prontosil and sulphanilamide do not act as such on bacteria at all but are both converted, probably by the reticulo-endothelial system, into some other and more active substance. The basis of this belief is the fact that the drug is ineffectual in experimental intraperitoneal infection if given by the same route. It saves life only when given by the mouth or parenterally; hence it is utilized primarily elsewhere than at the site of infection. His observations include elaborate studies of the cytology of the exudate in treated and untreated animals which are of much general interest, more particularly in exalting the defensive capacity of the macrophage and depreciating that of the polynuclear.

More illuminating perhaps than many pages of Levaditi's polemics is a simple experiment recently reported by Buttle.[6] In mixtures of monkey blood, sulphanilamide, and streptococci, bacterial growth always proceeded for two hours and then ceased. If the blood had previously been freed from leucocytes the number of streptococci then remained stationary; in the presence of leucocytes the number fell almost to zero. This experiment surely shows that there are two effects—one purely bacteriostatic and one which might be described as opsonic. But in the divergent attitudes of the two distinguished observers previously quoted one thing is common: they do not accept the phenomena of bacterial destruction in such simple tube experiments as the whole explanation of what occurs in the body. This point is vital not only in theory but in the devising of means whereby laboratory experiment may perhaps guide the course of future therapeutic trials. With the number of already synthesized sulphonamide compounds running into three figures and the whole range of pathogenic micro-organisms awaiting their attack, some simple preliminary method of testing anti-microbic activity would be a godsend if its results were significant in relation to clinical effect. It is now claimed by Osgood[7] that his method of observing the behaviour of bacteria in cultures of human marrow containing various concentrations of sulphanilamide will serve this purpose of preliminary trial. One of this author's principal conclusions is that sulphanilamide neutralizes streptococcus toxins, but his only evidence for it is absent or reduced haemolysis in cultures, and many antiseptics which are useless therapeutically have this effect on streptococci *in vitro*. These experiments leave it uncertain whether haemolysin is neutralized or whether its formation is prevented, but an experiment was reported some time ago by Meyer[8] in which the neutralization of pre-formed haemolysin appears to have been achieved with high concentrations of prontosil. This aspect of the matter needs fuller investigation.

[6] *Proc. roy. Soc. Med.*, 1937, **31**, 154.
[7] *J. Amer. med. Ass.*, 1938, **110**, 349.

HEALTH AT THE UNIVERSITIES

In the report of the British Medical Association's Committee on Physical Education[9] it is noted that physical education is "conspicuous by its absence" in universities. With few exceptions "the universities make no provision for gymnastic training with or without apparatus. Facilities for games and athletics are provided, but a considerable proportion of undergraduates do not participate in this side of university life." Even with regard to university departments for the training of teachers it is said that "very little physical education is obtainable and many students take little part in games." The committee deplored this neglect, particularly in the training departments.

> "A strong claim for the personal training could be made out on the ground of the benefit to the student's health and physical fitness and the consequent increased capacity to profit by the university course. Moreover, a knowledge of gymnastic training, games, and athletic sports, and a degree of skill in them, are of real professional value to teachers and an asset to their schools. . . . A satisfactory standard of physical education in senior and central schools is not to be expected so long as the university training departments as a whole continue to show a lamentable lack of interest in the subject."

It is now two years since that report was published, and these important pronouncements have perhaps not attracted so much attention as some other parts of the report. Their value as an initiative to reform in this field may, however, be stressed, and they are now strongly reinforced by the results of an inquiry conducted by the National Union of Students of the Universities and University Colleges of England and Wales and published in a pamphlet entitled *Student Health*.[10] In an introductory section attention is called to the B.M.A. report and to other similar statements by individuals, as well as to a section on general health services in the last quinquennial report of the University Grants Committee—commented upon at the time in the columns of this *Journal*—in which the provision for physical training in the

[8] *Quart. Bull. Sea View Hosp.*, 1937, **2**, 148.
[9] *Report of the Physical Education Committee*, 1936, British Medical Association, Tavistock Square, W.C.1. (Price 6d., post free.)
[10] *Student Health*, 1937, National Union of Students, 3, Endsleigh Street, W.C.1.

universities and of some form of student insurance against illness is advocated. Pronouncements such as these have no doubt produced some sort of intellectual conviction in university and associated circles, but apparently more is still needed to overcome what the N.U.S. report calls "the immense inertia of the established system," and to translate conviction into action.

To establish and recapitulate the facts demonstrating this need for action requires a few pages only. The report then goes on to give a valuable review of the university health services in the United States of America, in Canada, in Germany, and in Sweden, and to state the nature of the relatively little provision made for medical and health services in British universities at the present time. Then follow a short summary of recommendations previously made concerning such services and the establishment or improvement of physical education at universities, and proposals for a minimum policy on these matters made by the Committee of the National Union of Students itself. The needs and aims are really threefold: an insurance or contract scheme for the medical examination of students and their treatment and care in case of illness, such scheme to have regard to their economic position; the organization of systematic courses in physical training, together with the provision of suitable facilities, open to all the students and so designed as to attract and help those who merely want to keep themselves fit and improve their condition, whatever their future walk of life may be; the establishment of courses of a more technical character for those who will be responsible for physical education in the schools or as organizers of physical recreative training under the direction of local authorities. It is with the first two of these objects that the report is mainly concerned, but the third has become at the present time an important function of institutions of university rank. Again, there are at least three points which should be borne in mind as essential to the success of these developments. The object is to assist the student to better health and physical condition where he needs this, not at all to debar an unfit student from a university career. There should be considerable freedom of choice among activities, and not too much insistence on particular requirements. Under a director of physical education the general management, particularly of games, should continue to be exercised by the students themselves. The proposals of the N.U.S. report are on these lines, and the details given will be found helpful to all those who have responsibilities in this field or who are in a position to hasten the action which is more and more urgently needed.

ENDOCRINE FACTORS IN BREAST TUMOURS

That the mammary gland is one of the effector organs of the endocrine system is an observation not only of physiological interest but of pathological importance. The variation of response of different species to the hormones concerned has made it difficult to define the function of each particular factor, but the available evidence suggests that oestrin is responsible for the development and ramification of the ducts and for the proliferation of the periductal connective tissue, while progesterone opens up the terminal acini, and the lactogenic hormone of the anterior pituitary stimulates the secretion of milk. The definition of the part played by oestrin is substantiated in our present issue (p. 499) by the interesting study of Drs. Geschickter and Dean Lewis of cases of fibro-adenoma of the breast observed during pregnancy and lactation. The rapid increase in size of these growths during pregnancy is due to development of duct epithelium and the surrounding fibrous tissue. The response of the tumour to the increased concentration of oestrin during pregnancy depends on its previous state of development. In some cases the opening up of peripheral tubules with coincident proliferation of connective tissue leads to rapid enlargement of the tumour. In others already submitted to prolonged oestrogenic stimulation there is an exaggeration of the epithelial and fibrous proliferation, with blockage of ducts, formation of cysts, and epithelial overgrowth, without encapsulation—very closely simulating malignancy. In a third type intensive oestrogenic stimulation has led to fibrosis and hyalinization, so that the increased concentrations of oestrin in pregnancy are without effect on the tumour. Such observations offer fresh support for the principle that the response of a tissue to an endocrine stimulus depends not only on the concentration of the stimulating hormone but also on the sensitiveness of the tissue, which is determined by its structural and functional state at the time the stimulus is applied. This principle of the susceptibility of the tissue is probably of fundamental importance in determining the degree of response to endocrine stimulation. The females of certain strains of mice are highly susceptible to spontaneous mammary cancer; others are resistant to cancer. The administration of oestrin to the males of cancer-susceptible strains induces the development of mammary cancer in a percentage equivalent to that attained by the females, suggesting that these strains respond easily to oestrin and that in such strains oestrin, by virtue of intensive activity, may become carcinogenic. Fortunately the human breast appears to be more resistant to stimulation by oestrin, and it is improbable that the concentration of oestrin found at any time in the blood stream naturally or as the result of treatment can so activate the breast as to form a basis for malignant changes. The demonstration that oestrin may be responsible for innocent changes in the breast such as fibro-adenoma and cystic mastitis, however, suggests that the giving of some antagonist to oestrogenic activity may be a possible line of treatment for such conditions. Progesterone and the

male hormone appear to be antagonistic in certain circumstances. The latter is now being employed in cases of chronic mastitis and favourable reports are beginning to appear.

SPONTANEOUS RECOVERY FROM CANCER

The frequency of spontaneous cure in cancer has been placed at one case in 100,000. In fully authenticated cases a primary growth has been quite incompletely removed or merely subjected to biopsy and has nevertheless later disappeared, necropsy following death from another cause revealing no trace of the growth. Mr. Digby Chamberlain's case, described on page 508, involves a slight element of doubt, since the primary growth was excised, and the nature of both the enlarged glands which were seen and the liver nodule which was felt cannot be considered absolutely certain. The subject of spontaneous recovery from cancer has recently been reviewed by Touraine and Duperrat,[1] who discuss the circumstances in which it takes place and possible explanations of it. Of many factors which have been supposed to be responsible fever is most often mentioned, while infection of the growth, or the treatment of an infective condition, such as syphilis, in which the growth arose, has also been given credit for its regression. If these influences play any part they can only have this effect very exceptionally: infected growths frequently spread rapidly, and hyperpyrexia has been found unavailing in the treatment of growths in animals, even when carried to a point which would be unjustifiably dangerous in man. Although high temperatures are no more lethal to cancer cells than to the rest of the body, it remains possible that fever or some other disturbance may exceptionally cause a metabolic change inimical to the cancer cell. This metabolic hypothesis, completely vague though it is, appears to be one of the two chief possibilities, and it can go no further than to suggest that in some way the nutrition of the growth is interfered with. The other assumes the development of a humoral immunity, or at least a specific attack on the growth. Leucocytic infiltration at the margin, which is undoubtedly more pronounced when the growth rate is slow, and particularly so after successful irradiation, lends support to the idea that the body is capable of attacking a growth by the same means as are used against foreign invaders. The existence of a specific antibody to the cancer cell has been both asserted and questioned, and the part played by humoral immunity in cancer remains a matter of great doubt and difficulty. Regression occurs frequently in transplanted animal tumours; in some indeed it is the rule, and the contrast between the behaviour of these transplanted tumours and spontaneous growths is so marked that what is true of one may well not apply at all to the other. There is one encouraging aspect of this subject: the mere fact that human tumours ever regress, however rarely, suggests that some mechanism exists by which the same result could more often be brought about, and this may yet be discovered.

[1] *Presse méd.*, 1938, **46**, 57.

PHARMACOLOGICAL RESEARCH

The annual report of research work carried out at the College of the Pharmaceutical Society in 1937 shows that this college is actively continuing its work on the advancement of knowledge regarding the properties of drugs. The Department of Pharmaceutical Chemistry has investigated the chemotherapeutic actions of a series of acridine compounds and has found certain classes with a bactericidal activity greater than that of acriflavine. The Nutrition Department has continued its work on the testing of vitamin preparations, and also has carried out an interesting research on the effect of calcium-poor diets on the ash content of bones of rats, which has led to the conclusion that a child receiving an ordinary "poorer-class" diet and drinking London water would receive only about half the quantity of calcium necessary for normal bone development. The Department of Pharmacology has continued interesting researches on the standardization of the adrenal cortex preparations by their action in prolonging the life of adrenalectomized drakes. The testes of drakes have a big seasonal variation in size (3 grammes to 78 grammes) and a close correlation has been found between the effective dose of cortical hormone and the size of the testes. This discovery is of particular interest on account of the well-known effect of cortical tumours in producing sexual precocity. The report contains accounts of many other important researches, and it is of interest to note that the laboratories have given hospitality to a number of foreign workers. The year under review has seen important changes in the staff of these laboratories, and it will not be long before they move to new quarters in Brunswick Square. We wish them all success under the new conditions.

UNUSUAL FACTORS IN RICKETS

Although the majority of children with rickets are readily cured by adequate doses of cod-liver oil, types resistant to therapy occur from time to time. Such a case is fully reported by F. Albright, A. M. Butler, and E. Bloomberg,[1] who recount observations extending over fourteen years upon a boy now aged 16. He was not suffering from coeliac disease or from renal disease, two recognized causes of resistant rickets, but at the age of 2 he showed clinical and radiographical evidence of rickets, which failed to improve after nearly two years' treatment with cod-liver oil (3 drachms daily) and sunlight. The first problem the authors discuss is concerned with the abnormal condition of the bones—was it true rickets? Histological examination of a portion of the sternum removed for biopsy, the *x*-ray appearances, and investigation of the metabolism of calcium and phosphorus proved that the bony changes were undoubtedly those of rickets. The part played by the parathyroids had also to be considered, as it is now accepted that there is some degree of hyperparathyroidism in rickets. At operation only three of the glands were found and none was enlarged, although there was definite hyperplasia in one removed for

[1] *Amer. J. Dis. Child.*, 1937, **54**, 529.

section. Post-operative chemical changes in the blood favoured the view that a secondary hyperparathyroidism was probably present in this case. Thinking that the absorption of vitamin D might be at fault, the authors injected a crystalline preparation intravenously, but this had no beneficial effect. Next the oral dose of vitamin D was pushed up to extreme limits (1,500,000 U.S.P. units of vitamin D daily, equivalent to 15 litres of cod-liver oil), and at last there was some *x*-ray evidence of healing. It is pointed out that most careful and frequent examinations of the blood must be made with such dosage to avoid the calcifying effects of hypervitaminosis. In such a patient as described above there is some intrinsic resistance to the action of vitamin D, but the aetiology of the resistant rickets is at present unknown. A possible biochemical factor in certain cases is suggested by B. Hamilton and M. M. Dewar.[2] They found that when sodium citrate was added to a rachitogenic diet in the proportion of 0.4 mol to each kilogramme of diet it prevented the development of rickets in rats, and a similar effect was produced by sodium tartrate and sodium bitartrate in the proportion of 0.8 mol to each kilogramme of diet. Citric and tartaric acids also had an antirachitic effect, although it was less marked than that of sodium salts. Further, the acids and the salts promoted healing when administered to rachitic animals. Various factors are probably concerned with these effects. For example, the hydrogen ion concentration of the gastro-intestinal contents is probably increased by the acids and thus the solubility of the calcium phosphate compounds is enhanced. Changes in the acid-base metabolism of the body may also come into the picture, and in this connexion the results reported by G. Graham and W. G. Oakley[3] of the effects of administering alkalis in cases of renal rickets are of interest. Despite the downward progress of patients with this disease, massive doses of alkalis effected some temporary control.

POLIOMYELITIS IN NEW ZEALAND, 1936-7

The annual report of the New Zealand Department of Health for the year ended March 31, 1937, records a slight rise in the death rate, which was 8.75 per thousand. Infant mortality was the lowest ever recorded—namely, 30.96 per thousand live births. There was also a welcome rise in the birth rate and a substantial decline in maternal mortality. The latter was 3.70 per thousand live births. Deaths from septic abortions are included in this figure. In 1924, when an active campaign for the promotion of maternal welfare was first inaugurated, the maternal death rate was 5.0. All the above statistics are exclusive of the Maori population. The chief epidemiological feature of the year under review was an outbreak of acute poliomyelitis, which occurred in Dunedin during December, 1936. In the first three weeks notifications were 2, 16, and 40 respectively. The public were informed immediately and picture-theatre proprietors co-operated by voluntarily excluding children from their establishments through the whole of New Zealand. All schools were closed. The authorities sought the collaboration of representatives of the New Zealand Branch of the British Medical Association. As a result in each of the four main centres a practitioner with special knowledge of poliomyelitis and its treatment was appointed whose experience was available for his colleagues in consultation. The great majority of the cases were treated in hospital. Nevertheless, despite all precautions the disease spread through the whole of New Zealand during the first quarter of 1937. Practically no district escaped. The peak of the epidemic was reached in April, when there were 246 cases. During the period from December, 1936, to the end of June, 1937, there were 819 cases, including 43 Maoris; the deaths numbered 39. It is stated that a fuller account of the epidemic will be published in the next annual report.

URINARY IODINE IN HYPERTHYROIDISM

Iodine is excreted through the kidneys, sweat glands, salivary glands, and in the bile. The amount excreted depends chiefly on the intake, and this is borne out by the striking diminution in urinary iodine among the population in regions of endemic goitre, where the environmental iodine is low. In hyperthyroidism, however, where the intake is not in excess of normal, the urinary excretion of iodine is increased, as the patient is in a state of negative iodine balance through increased production of the iodine-containing hormone of the thyroid gland and consequent depletion of the iodine stores. G. M. Curtis and I. D. Puppel[1] have investigated the urinary excretion of iodine in forty patients with hyperthyroidism. They found that the average urinary excretion was 184 γ of iodine per day, which was between three and four times greater than that of normal subjects, their average figure for these being 51 γ of iodine per day. The variability of the daily urinary excretion of iodine in hyperthyroidism was considerable, ranging on an average from 30 to 593 γ, and these variations corresponded to the variations of the clinical features of the disease. They consider, however, that a normal urinary excretion of iodine in hyperthyroidism does not necessarily indicate that there is not a pathologically increased loss of the body iodine, as there may be a greater output of iodine through other channels, or there may be retention of iodine through renal insufficiency or a depletion of available utilizable iodine. There is no evidence, however, that their patients had any impairment of renal function. Nevertheless the authors present evidence in favour of at least partial depletion of the iodine stores, such as an increased retention of iodine immediately after its administration. This depletion of the iodine stores in the absence of a sufficient intake may explain some of the spontaneous remissions of toxic goitre. Determinations of the blood and urinary iodine would be of considerable diagnostic importance in those cases of neuro-circulatory asthenia in which the clinical features simulate borderline hyperthyroidism.

[1] *Arch. intern. Med.*, 1937, **60**, 498.

[2] *Amer. J. Dis. Child.*, 1937, **54**, 548.
[3] *Quart. J. Med.*, 1937, **6**, 478.

FIG. 1.

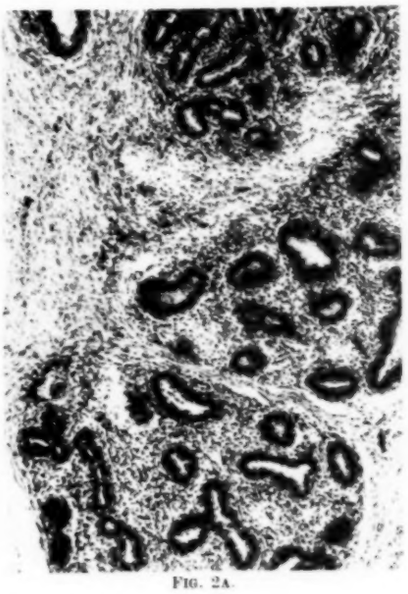


FIG. 2A.

FIG. 2B.

FIG. 3.

FIG. 4A.

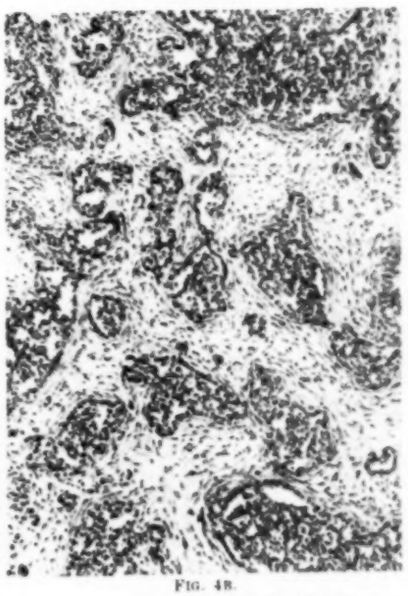


FIG. 4B.

FIG. 5A.

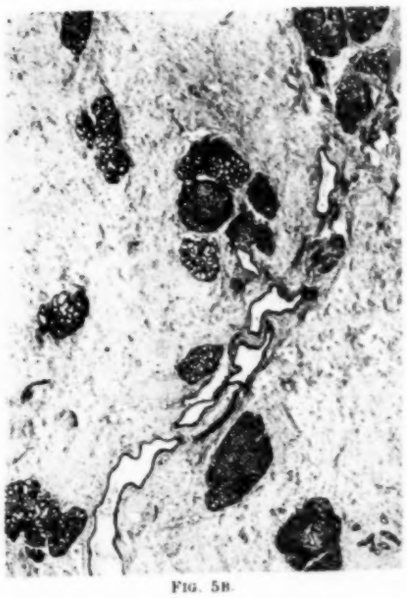


FIG. 5B.

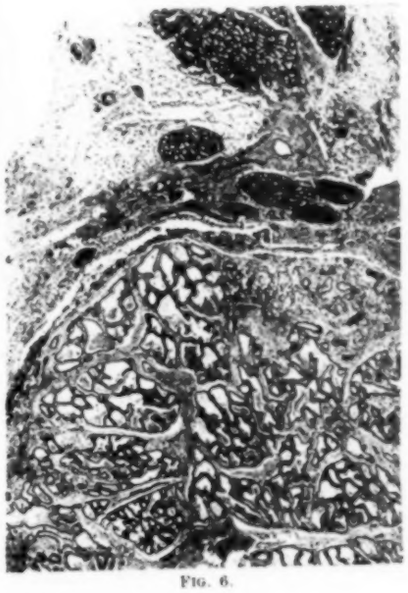


FIG. 6.

FIG. 7.

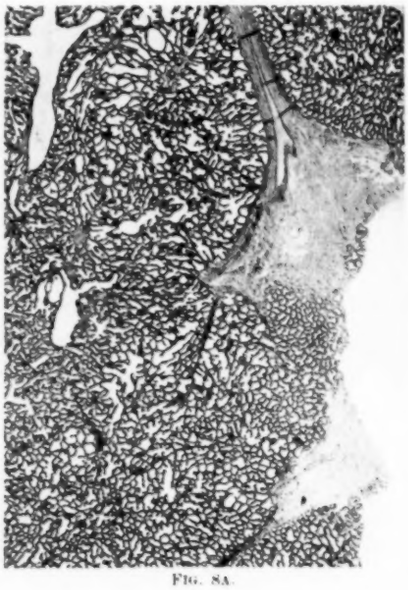


FIG. 8A.

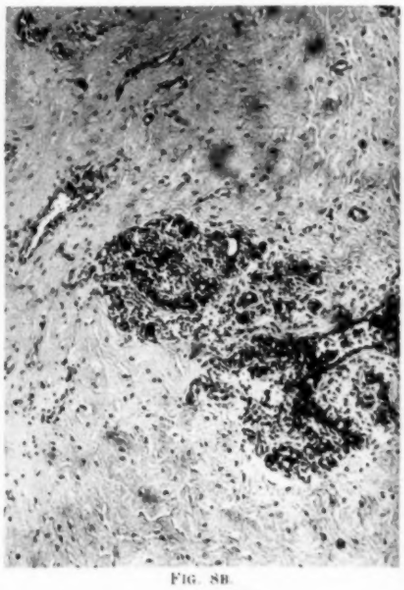


FIG. 8B.

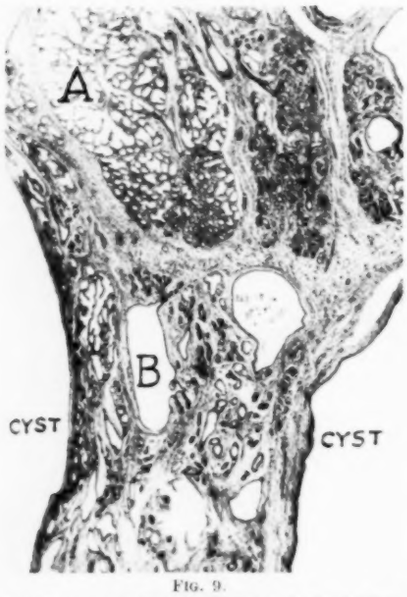


FIG. 9.

FIG. 10A.

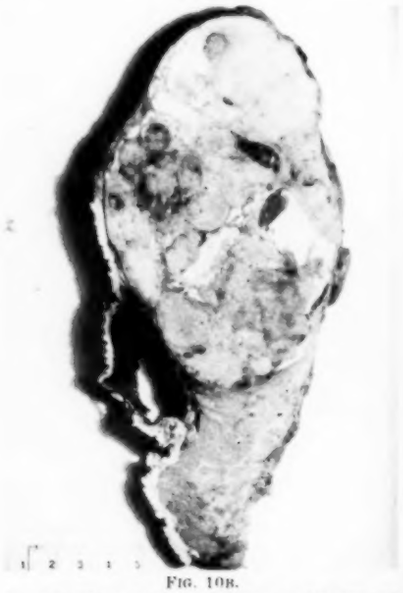


FIG. 10B.

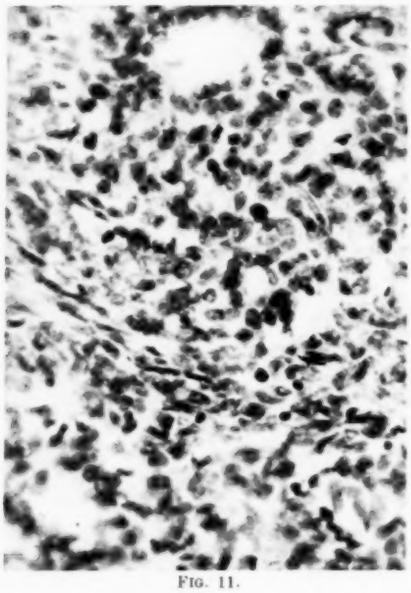


FIG. 11.

FIG. 12.

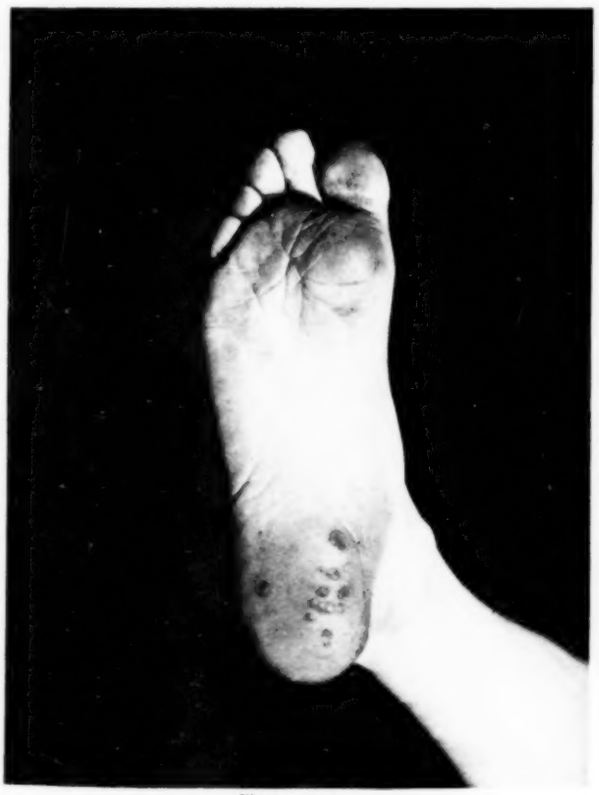
FIG. 13.

DIGBY CHAMBERLAIN: SPONTANEOUS DISAPPEARANCE OF CARCINOMA

FIG. I.—Showing the proliferative character of the growth. (× 45.)

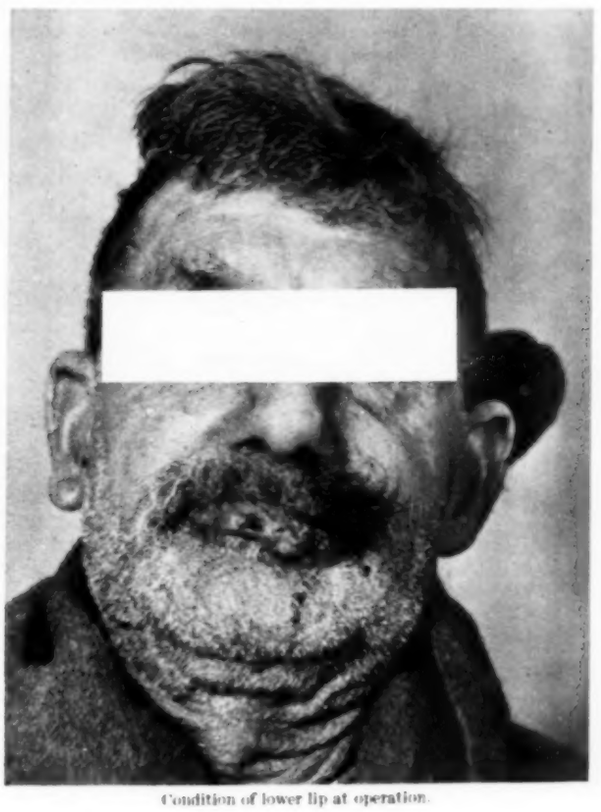
FIG. II.—Showing how the growth is invading the muscle. (× 45.)

R. M. B. MacKENNA: THE PLANTAR WART



Plantar warts.

PHYLLIS F. L. DAPLYN: BLOCK ANAESTHESIA FOR INSERTION OF RADIUM TO EPITHELIOMA OF LIP



Condition of lower lip at operation.

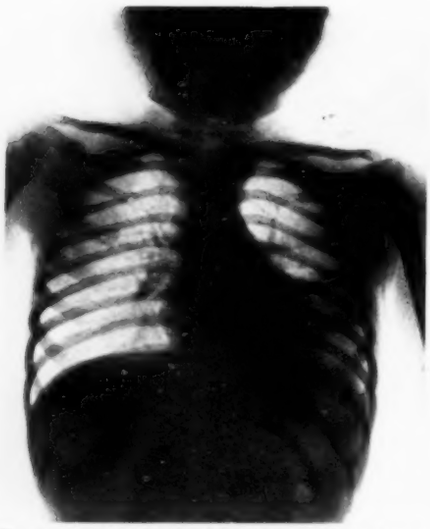


FIG. 1.—Case 1. Opacity left middle and lower zones.

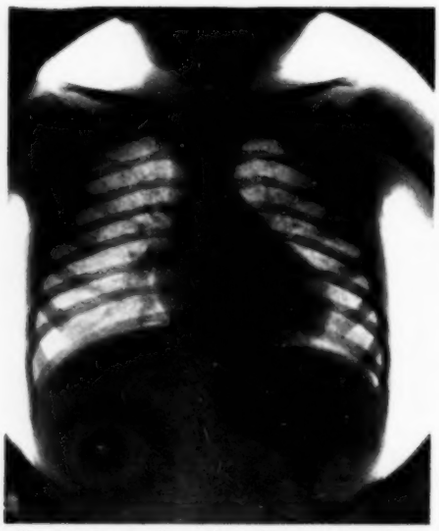


FIG. 2.—Case 1. Resolution of pneumonic process.

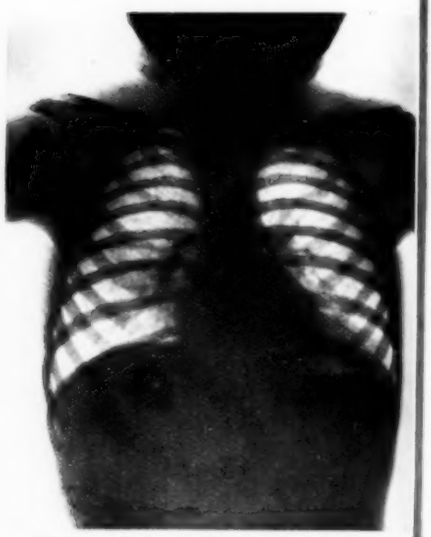


FIG. 3.—Case 6. Allergic bronchopneumonia.

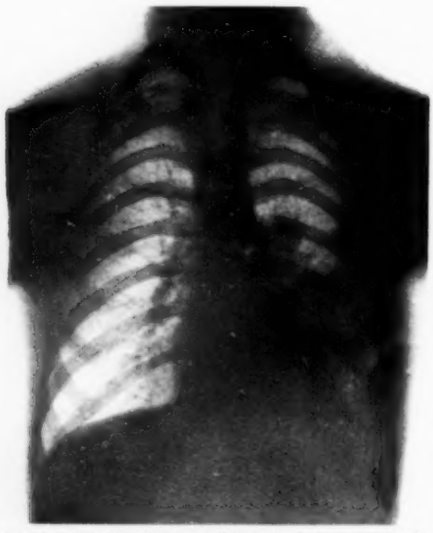


FIG. 4.—Case 7. Enlarged hilar glands; opacity left lower zone.

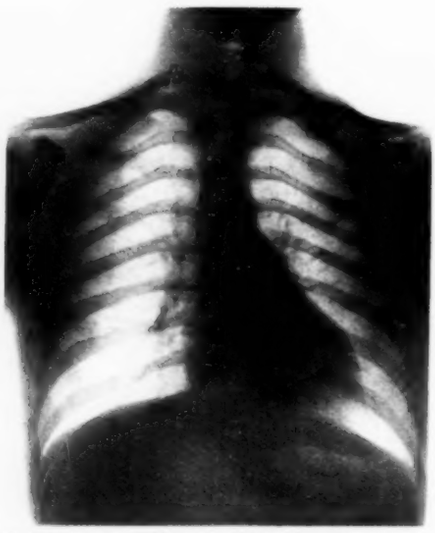


FIG. 5.—Case 7. Resolution of pneumonic process.

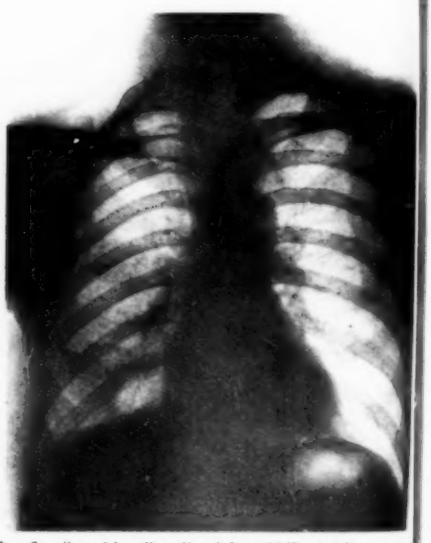


FIG. 6.—Case 10. Opacity right middle and lower zone

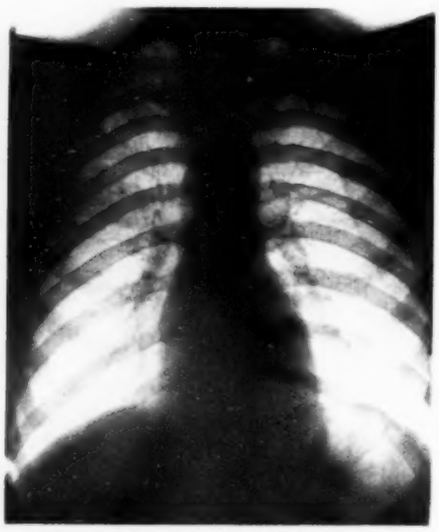


FIG. 7.—Case 11. Opacity right upper zone.

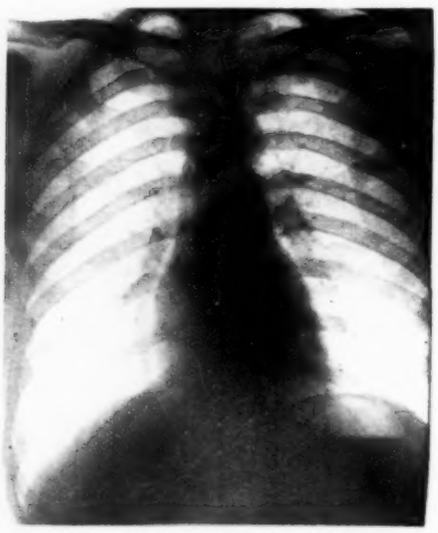


FIG. 8.—Case 11. Resolution of pneumonic process.

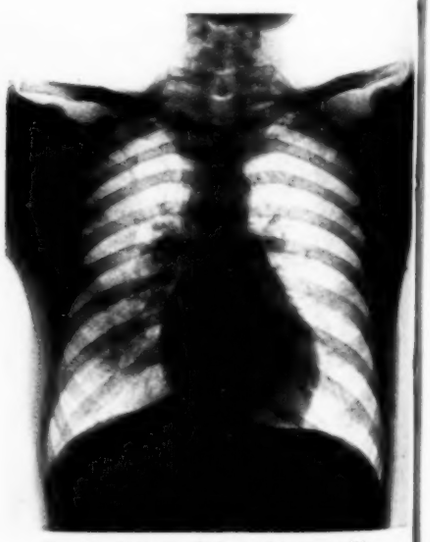


FIG. 9.—Case 12. Influenzal pneumonitis.

SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

THE TREATMENT OF JOINT SPRAINS AND STRAINS

BY

R. C. ELMSLIE, M.S., F.R.C.S.

The terms "sprain" and "strain" cover a variety of injuries to joints in which there is no evidence of a gross fracture or dislocation. As a rule when a definite injury—a fracture, a dislocation, a complete rupture of an important ligament, or a displacement of a semilunar cartilage, etc.—has been found, the fact that an exact diagnosis has been made takes the case out of the category of sprains or strains. Therefore in all these cases of minor injuries of joints the first thing to aim at is an exact diagnosis. It is not uncommon to find that a joint injury which has resulted in an effusion is diagnosed as a case of traumatic synovitis. There are grave objections to this diagnosis because it is apt to lead to slack methods and to a failure to discover exactly what has happened. We ought to try to determine what has been the nature of the trauma and exactly what lesion has been produced in the joint.

Classification of Ligaments

From the practical point of view the ligaments of joints may be divided into three classes:

1. Those consisting of a simple thickening of the capsule which cannot be defined exactly by dissection except in an artificial manner. As is the case with the joint capsule as a whole, the attachment of these ligaments to bone is also indefinite; the fibrous tissue of the ligament is continuous with that of the periosteum beyond, which can be stripped up if the ligament is artificially lifted. The internal lateral ligaments of the knee and ankle, and in fact the majority of ligaments of joints, fall into this category.

2. Extracapsular bands which stand out, when dissected, as isolated structures. Such are the external lateral ligament of the knee and the middle and posterior fasciculi of the external lateral ligament of the ankle.

3. Intra-articular bands, such as the crucial ligaments of the knee, the ligamentum teres of the hip, and the intra-articular fibro-cartilage of the sterno-clavicular joint.

Injuries of Capsular Ligaments

Ligaments of the first category are not likely to be ruptured completely unless the capsule is itself extensively torn by such a force as may produce a dislocation of the joint. In a sprain the injury to the ligament is partial, and it is most likely to occur at the point of attachment to the bone. The joint cannot be sprung open, and no hypermobility or instability of the joint results. For example, in the case of the internal lateral ligament of the knee-joint forced abduction of the tibia on the femur strains the point of attachment of the ligament to the internal condyle of the femur. This point is tender, and some swelling and possibly discoloration appear over it. But the knee does not become hypermobile, and cannot be sprung open on the inner side by forcing the tibia outwards. In fact, mobility of the joint is restricted by pain, and the knee is generally held in a position of slight flexion because in this position the ligament is relaxed and therefore less painful.

The common sprain of the ankle is an injury of the anterior fasciculus of the external lateral ligament, produced by twisting the foot inwards while it is in a position of slight plantar flexion. Either the substance of the ligament or its attachment to the neck of the astragalus may be injured, and the tender spot varies accordingly. But the movement of the foot, particularly inversion, is diminished by pain. There is no hypermobility.

Sometimes in injuries of this class the strain upon the ligamentous attachment pulls off a portion of the bone, or it may, as already mentioned, pull up the periosteum for a short distance beyond the actual ligamentous attachment. The detachment of a fragment of bone constitutes a sprain fracture. These injuries occur frequently and characteristically in the interphalangeal joints and metacarpo-phalangeal joints of the hand, where a lateral or antero-posterior strain may either damage the point of attachment of the lateral or anterior ligaments or else may tear off a tiny fragment of bone from the margin of the phalanx or metacarpal head. On the posterior surface such injuries are uncommon because flexion of the joints is free; the terminal joint is an exception, but there the extensor tendon is commonly damaged and not the joint ligament. The tendon may rupture or tear off a fragment of the phalanx.

Sprain fractures also occur at the attachment of the internal lateral ligament of the knee to the femur, the usual site of an injury to this ligament. A fragment of bone may be torn off at the time of the injury and be shown by a radiograph; or the bony fragment may only appear later and be due to pulling up of the periosteum. In the latter case the bone may be high up on the condyle and not apparently at the site of attachment of the ligament. This fact has led to the naming of this condition Stieda-Pellegrini disease, in the belief that it is not due to injury of the ligament at all. This seems to be a quite unnecessary refinement. Sprain fractures also occur in a more gross and obvious form, as, for example, when the internal epicondyle of the humerus is pulled off by an abduction strain of the elbow and in fracture of the great tuberosity of the humerus.

Injury of Intra- or Extra-articular Bands

Rupture of such ligaments as the external lateral ligament of the knee, the crucial ligaments, and the middle fasciculus of the external lateral ligament of the ankle gives rise to instability of the joint which is immediate. Thus, in the knee if the external lateral ligament is ruptured the knee can be sprung inwards and opened up on the outer side; if the crucial ligaments are ruptured, even incompletely, excessive antero-posterior mobility of the joint is present. In the case of the ankle rupture of the middle fasciculus of the external lateral ligament allows excessive inversion of the foot, the astragalus tilting in its socket—a fact which can be demonstrated by taking a radiograph in full inversion. The posterior fasciculus of this ligament does not appear to be often injured, but when strained it may pull off the posterior tubercle of the astragalus, to which it is attached; this tubercle sometimes occurs as a separate bone (os trigonum). Such an injury leads to chronic pain and

swelling behind the ankle on the inner side, which may persist until the separate piece of bone has been removed.

This last injury is, again, an example of a sprain fracture. Other examples occur—for example, the external lateral ligament of the knee may pull off a fragment of the head of the fibula, or the anterior crucial ligament may pull up the mesial spine of the tibia.

Injuries of Muscles and Bones in the Neighbourhood of a Joint

In investigating a case of supposed joint sprain or strain it must not be forgotten that the injury may really be one of a muscle, tendon, or bone. For example, forced inversion of the foot may sprain the anterior fasciculus of the external lateral ligament or it may rupture the middle fasciculus, but it may cause an oblique crack through the external malleolus of the fibula; or the tension on the peroneus brevis muscle may pull off the base of the fifth metatarsal bone (Jones's fracture) or pull some of the muscle fibres off its origin from the fibula. These injuries are disclosed by the exact position of the point of maximum tenderness, and in the first two cases are confirmed by radiographs. After forced dorsiflexion of the foot the calf muscles and tendo Achillis must be carefully examined: rupture of the tendon may easily be overlooked if much effusion is present. In young persons an incomplete injury in the neighbourhood of the epiphyseal bone should be borne in mind, particularly in the case of the hip-joint.

Exact Diagnosis

The multiplicity of the injuries which may be present in a case of strain of a joint would seem at first to make diagnosis a rather formidable task, but with care this should not be difficult. If possible the exact mode of injury should be determined; this helps by showing what structures were put on the stretch. When the examination takes place after a considerable effusion has formed the latter may to some extent mask the symptoms, but there should be no hesitation about feeling firmly into this swelling, particularly over important tendons such as the tendo Achillis and the tendon of the quadriceps. The site of maximum tenderness to pressure is important. It may be over the ligament or its attachment to a bone; if the latter, and if the tenderness is considerable, a sprain fracture may be suspected and a radiograph should be taken. If the point of tenderness is over the shaft of the bone a radiograph is essential in order that a fracture may be excluded. The mobility of the joint is important: hypermobility denotes complete rupture of some important structure. Limitation of mobility —without, however, complete blocking of movement—is the rule in the ordinary less severe sprain. The ideal would be to *x*-ray every case of joint sprain, but this may not be possible or practicable. A radiograph is essential:

1. When the maximum tenderness is over the shaft of a bone.

2. When the tenderness is over the point of attachment of an important ligament or tendon.

3. When movement of the joint appears to be mechanically blocked—for example, when extension of the knee-joint is blocked.

4. It is wise in the case of all severe sprains in children and adolescents because of the risk of bone injury. This applies especially to the hip-joint.

When other injuries have been separated those which are properly classified as sprains of joints may for purposes of treatment be divided into three groups: simple sprains; sprain fractures; and sprains which render a joint unstable.

Treatment of Simple Sprains

In treating a simple sprain of a ligament which forms part of the capsule of the joint and which is incompletely ruptured the first step is to prevent or limit effusion. This is best done by firm elastic pressure. For example, if an ordinary sprain of the ankle is seen within half an hour the site of injury may be wrapped in a complete covering of thick cotton-wool extending from the metatarsal heads to the middle of the leg and bandaged firmly from below upwards over this with a domette bandage, which should not extend beyond the cotton-wool. Some nervous patients will not tolerate this pressure; in these cases a cooling lotion, such as lotio plumbi c. opio, should be applied. In either case twenty-four hours' rest should be allowed. At the end of that time the bandage may be removed and the joint re-examined to confirm the diagnosis. If a radiograph is considered necessary it should be taken and bone injury thus excluded. The joint should then be firmly bound with an adhesive bandage of the elastoplast type, and the patient encouraged to begin use of the limb. In the case of the ankle a shoe should be worn if it can be got on, and the patient should walk with the help of a stick but not with crutches. He should be told to keep the foot under him and walk in as natural a manner as possible, allowing slight movements of the ankle-joint. In the case of the knee and elbow it is more comfortable to retain the compression bandage over cotton-wool, as the free range of movement of these joints is apt to lead to soreness of the skin under adhesive strapping.

At the end of a week the strapping is removed and is replaced by a simple crêpe bandage, and massage and movements are started. The masseur should be instructed first to get rid of the effusion, then to help all active movements through as full a range as possible, and to follow on with exercises in normal use. In the case of the ankle the patient must be encouraged to walk with a natural heel-and-toe movement, be given tiptoe exercises with support, and be persuaded to invert, evert, and dorsiflex the foot through a normal range. Finally, in the later stages of treatment movements which are incomplete must be forced gently until they are complete. If even a little restriction of dorsiflexion, plantar flexion, or inversion of the foot remains there may be persistent discomfort and a tendency to sprain the ankle again. Some nervous patients will not walk early upon a sprained ankle. In such a case it is better to retain the compression bandage and trust to the persuasive powers of a good masseur.

Treatment of Sprain Fractures

Sprains in which a small portion of bone has been torn off and those in which the periosteum has been lifted do not do well on treatment by the methods described above. There is a tendency to the production of a chronic painful thickening with limited movement. This applies to most sprains of the finger- and toe-joints and to sprains of the internal lateral ligament of the knee. These cases should be strapped up securely from the start and only a limited range of movement allowed; massage should not be given over the injured regions, and move-

ment should on no account be forced. The strapping should only be left off and increased use encouraged when the swelling and tenderness subside. This is likely to take at least six weeks, and may take several months, especially if injudicious use and movement have been allowed early. In the case of the knee-joint the use of a compression bandage with gentle walking exercise and some faradic treatment of the quadriceps muscle will suffice in the slighter injuries. In severe cases, in any region, when a radiograph shows ossification in the attachment of the ligament or beyond it the joint should be immobilized on a splint in an easy position just short of full extension until all pain and tenderness have disappeared, and movement then restored by gentle persuasive methods and without the use of force.

Treatment of Sprains which Render a Joint Unstable

These include ruptures of important ligaments and the cases of sprain fracture in which an important ligamentous or muscular attachment has been damaged—for example, fracture of the head of the fibula, the spine of the tibia, the internal epicondyle of the humerus, the attachment of the long extensor of the terminal phalanx of the finger, etc. The treatment of these injuries is really a part of major surgery and in many cases operation is advisable, but the recognition of the nature of the injury and its immediate treatment are important. The joint should be at once immobilized on a splint or, better, in plaster-of-Paris in a position in which the ligament affected is relaxed, and if there is difficulty in securing the position an anaesthetic should be given. Drop-finger due to damage to the extensor tendon should be splinted in hyperextension. Rupture of the middle fasciculus of the external lateral ligament of the ankle requires fixation in plaster with the foot at a right angle and everted. Rupture of the external lateral ligament of the knee-joint or fracture of the head of the fibula should be treated by plaster with the knee extended and the tibia forced outwards. Rupture of the crucial ligaments or fracture of the tibial spine requires fixation with the knee fully extended; in the latter case an anaesthetic is necessary in order to secure this position.

In the case of fracture of the internal epicondyle of the humerus operative fixation is essential because the fragment is pulled down by the pronator-flexor group of muscles. In all this group of cases the necessary surgical treatment by fixation support, etc., and possibly operation, can be facilitated by early diagnosis and correct fixation; in fact, in many cases the need for operative treatment may thus be avoided.

The third International Cancer Congress under the auspices of the International Union against Cancer will be held in the United States, September 11 to 16, 1939, at the Haddon Hall Hotel, Atlantic City, New Jersey. The president of the congress is Professor Francis Carter Wood, Director of the Institute of Cancer Research of Columbia University, New York City; Dr. Donald S. Childs of Syracuse, New York, is the secretary-treasurer; and Dr. A. L. Loomis Bell of Long Island College Hospital, Brooklyn, New York, is in charge of transportation and exhibits. The proposed sections are as follows: general research; biophysics; genetics; general pathology of cancer; surgery of cancer; radiological diagnosis of cancer; radiotherapy of cancer; statistics; and education. The membership fee is 15 dollars. All inquiries should be addressed to the Institute of Cancer Research, 1145, Amsterdam Avenue, New York, N.Y.

DIABETES AND ITS TREATMENT

LETTSOMIAN LECTURES BY DR. GEORGE GRAHAM

The first of the three Lettsomian Lectures under the auspices of the Medical Society of London was delivered on February 21 by Dr. GEORGE GRAHAM, who took as his general subject a survey of the changes and results of treatment of diabetes in the last fifteen years.

Dr. Graham began by remarking that Lettsom apparently never addressed the society on any subject connected with diabetes, although in his time the presence of sugar in the urine had been demonstrated. Lettsomian Lectures on diabetes, however, had been delivered in 1860 and again in 1912. During the twenty years before the introduction of insulin diabetes was regarded as a very serious disease, and it was generally held that patients did not live for more than two years. That was not quite true, though certainly the majority did not live very long. The fasting treatment had helped a certain number, and it had been possible sometimes to stop a patient from passing sugar.

It was now a common contention among anti-vivisectionists that insulin was discredited because since its introduction the deaths from diabetes had gone up. This was true, though the statement unqualified contained a great fallacy. The lecturer showed a number of graphs indicating the death rate in England and Wales during the present century. One curious point brought out was that there were formerly always more men than women in the mortality tables of diabetes, but since the war this position had been reversed, and for many years past far more women than men had died of the disease. There was also a mysterious drop in the figures during the war years. It was suggested that this was due to dietary restrictions imposed by the war, but possibly in the absence of many doctors abroad patients were not examined as carefully as at other times, and deaths were attributed to other causes.

Deaths from Diabetes

The answer to the anti-vivisectionist was evident when the figures came to be examined for each decade of life. During the last fifteen years the deaths from diabetes for the age period 6–15 showed a 34 per cent. decrease for both sexes; for the age period 16–25 also a decrease—29 per cent. in the case of females and 41 per cent. in the case of males. A decrease of similar extent was recorded in the two following age groups, covering the period 26–45. In the age period 46–55, while there was still a decrease in the number of deaths of males, though of smaller extent than in the earlier periods, there was actually an increase in the number of deaths of females, and for the later age periods there was an increase in the death rate for both sexes, specially marked in the case of women.

During the period covered by the statistics the number of persons of 70 years of age and over per 10,000 of the population of England and Wales had gone up from 297 in 1911 to 344 in 1921, 426 in 1931, and 455 in 1934. Thus there were many more old people alive, and because people were living longer they were more liable to those diseases, diabetes being one, which their shorter-lived predecessors had escaped, having died probably of some disease more frequently attacking the young and early middle-aged. A further factor which had to be remembered in studying the figures was that in the later years of the period under survey doctors were more careful with regard to the examination of the urine, not only for albumin but for sugar. There had also been a change in the practice of death certification, and if pneumonia or bronchitis was the immediate cause of death and diabetes a contributory cause, the latter as well as the former would be mentioned on the certificate.

Analysis of Hospital Cases

Dr. Graham then gave an analysis of the cases admitted to his hospital (St. Bartholomew's) for diabetes during the period 1923–32 and their present condition so far as known:

Age Groups	Total Cases	Deaths	Unknown	Alive
0–5	2	1	–	1
5–15	29	6	8	15
16–25	46	15	5	26
26–35	44	17	6	21
36–45	52	19	7	26
46–55	59	22	7	30
56–65	45	23	4	18
65+	28	18	2	8
	305	121 (39.6%)	39	145 (47.5%)

These were cases which had been in hospital, and they were not quite a fair sample of diabetes cases, being too few at both extremes of age. The death rate in these cases had improved in the more recent years, due to the benefits of the high carbohydrate diet instituted in 1929. He had ascertained the cause of death in a number of these cases. It included coma in twenty-eight, pneumonia in twelve, bronchopneumonia in three, lung diseases in seventeen, influenza in seven, heart failure in eight, gangrene of legs in six, uraemia in four. He had been struck by the very poor resistance that these patients put up to pneumonia, but there was an improvement under the regime of adequate carbohydrate and fluid as well as insulin. One hundred unselected patients who came up to hospital in 1937 and had had diabetes more than five years previously had been examined, and the time since the disease began was from five to ten years in forty-six, eleven to fifteen years in thirty-nine, and sixteen years and over in fifteen.

Complications

On the subject of complications Dr. Graham said that the teaching that neuritis was common in diabetes did not tally with his experience, but one thing that did trouble these patients was very severe pain in the legs, described as "a shooting pain," exactly like the pains in tabes dorsalis. He had known a few patients who had the same pains very badly in the arms. The reflexes and sensations were preserved, and therefore it could not be that the nerve was implicated; it was probable that the pain was due to some central lesion. When the diabetes was got under control these patients lost their pains. In his list there were thirty-two ophthalmic patients, nearly all of them elderly people; sixteen had senile cataract. Patients sometimes came with perfectly normal vision, and on being given insulin they were unable to see, the eye becoming misty, but the condition cleared up later on.

One complication peculiar, so far as he knew, to his own clinic was that during the last three years about twenty-eight cases had developed jaundice, with very high van den Bergh reactions. With one exception they had all recovered, the exception being a man who developed a severe pyelonephritis. But they took a long time to get well, one of them eighty days. He had been very much disturbed by this occurrence. There was no common factor. He had a feeling that there was some infection which they picked up from one to another when they came to the out-patient department.

In conclusion he mentioned some of the disabilities under which diabetic persons laboured, even though their diabetes was controlled by insulin. They could not insure their lives, except at very high rates, nor could they take up any posts with pension rights, and they were gravely disadvantaged in regard to driving cars. He gave an account of the precautions on which he insisted if one of his patients was determined to drive a car. The trouble with these patients was that they might suddenly cease to recognize that their blood sugar was low, and then they went on and became unconscious or had an epileptiform convulsion. The perplexing thing about the condition was the way in which the symptoms suddenly changed. He instanced one man who suddenly developed a severe diuresis, also a very deep depression, and with depression some patients got violent headaches.

CROYDON TYPHOID REPORT

THE MINISTER'S VIEWS

Matters arising from the report of the inquiry into the outbreak of typhoid fever at Croydon[1] are reviewed in a letter addressed to the Croydon Corporation on February 21 by the Permanent Secretary of the Ministry of Health on behalf of the Minister, Sir Kingsley Wood. The letter is as follows:

SIR,—I am directed by the Minister of Health to inform you that he has considered Mr. Harold Murphy's report on the public inquiry held by him into the causes leading up to the outbreak of typhoid fever in the County Borough of Croydon in October and November, 1937. Sir Kingsley Wood, who has followed the course of the epidemic with the deepest concern, finds himself in agreement with the findings of the report, which he has no doubt have been also studied by the Corporation with the object of applying the lessons to be drawn therefrom for the guidance of their administration hereafter, and in particular as affecting the conduct of their water supply service.

The Minister is glad to observe that Mr. Murphy has been able to commend the skill and care with which cases of the disease were handled once they had been reported, and the efficient character of the hospital arrangements, the nursing, and the general medical services of the borough. On the other hand he cannot but feel that the Corporation will share his disquiet at Mr. Murphy's finding (as regards the water service) that the organization of the administration of the borough was such as to lead to "both misunderstanding and lack of communication between the responsible officers of the Corporation in connexion with the work." Sir Kingsley Wood trusts that the Corporation will at once review the *whole* field of their work in the light of this important consideration. A fundamental condition for the successful discharge of administrative responsibilities of the magnitude and complexity of those committed to the Corporation is the effective collaboration and co-operation of all the branches and departments into which the work must of necessity be divided. Mr. Murphy's report enforces the painful reflection that if this obvious truth had been sooner and more perfectly realized the calamity which we now have to deplore might have been averted. The Minister cannot too strongly impress on the Corporation the necessity for giving their immediate attention to this serious criticism, and he will be glad to be informed at an early date what steps they propose to take to remedy what experience has unhappily shown to be a grave defect in their administrative arrangements.

I am directed to request you to draw the attention of the Corporation to certain other points in the report which he considers to be specially important. The first is Mr. Murphy's finding that the borough engineer's duties covered so wide a range of matters as to make it impossible for him to give detailed personal attention to the highly important subject of water supply, and his consequential suggestion that the Croydon water supply should be under the direction of a fully qualified water engineer reporting to a water committee and keeping in close touch with the medical officer of health. The Minister commends this suggestion to the Corporation. In his view the water engineer should be a chief officer of the Corporation directly responsible to the water committee. He also considers it essential that the water committee and the water engineer should work in the closest co-operation with the Public Health Committee and the medical officer of health in all matters of common concern. He will be glad to be informed that the Corporation are making the necessary arrangements.

[1] The report was summarized at length in the *British Medical Journal* of February 19, 1938, p. 404.

Reference is made in the report to representations made at the inquiry that it would be of great advantage in dealing with an epidemic of this kind if there were means of securing closer contact and more ready communication between the medical officer of health and the general body of practitioners, so that all the information available from time to time as to symptoms and possible causes could be pooled and distributed. While recognizing that the sole responsibility for dealing with an outbreak must, as the report emphasizes, rest with the medical officer of health, the Minister, as he has previously stated in Parliament and elsewhere, considers it important that all practicable steps should be taken to secure the effective co-operation of local practitioners in this as well as in other matters with which the medical profession, as such, is concerned.

The Minister appreciates the importance which the Corporation doubtless attach to bringing the water from Addington well back into supply at an early date subject to necessary safeguards, and he does not dissent from the conclusion in the report that, with due attention to the gathering ground and suitable chlorination, there is no reason why the Addington well should not provide a perfectly healthy drinking water. The arrangements to be made for the treatment of the water are matters on which the Corporation will no doubt seek expert advice, and the Minister understands that they have already appointed consultants for this purpose. In this connexion the Council will no doubt pay particular attention to the view expressed by Mr. Murphy on the evidence submitted, that analysis of the water from the Corporation's chalk wells should be made more frequently than has been the practice in the past.

In addition to the general and fundamental need for improved co-ordination of the work of the committees and officers of the Council, and to the particular points to which I have referred above, the report deals with a number of other matters which merit, and will doubtless receive, attention. The Minister will be glad to learn from the Corporation at an early date the result of their consideration of the issues raised and to be informed generally of the action to be taken in the light of the report. If the Corporation so desire the Minister would be happy to arrange for his officers to discuss with them and their advisers any points arising on which it is thought they can be of assistance.

I am, Sir,

Your obedient servant,

GEORGE CHRYSTAL.

Reports of Societies

MINERAL SALTS IN THERAPY

At a meeting of the Section of Medicine of the Royal Society of Medicine on February 22, Dr. H. LETHEBY TIDY presiding, a discussion took place on mineral salts in therapy.

Rationale of Sodium Therapy

Dr. R. A. MCCANCE of the biochemical department, King's College Hospital, said that about 60 per cent. of the body was water. Roughly two-thirds of this was in the body cells; the remaining one-third—in the blood, lymph, cerebrospinal fluid, and intercellular spaces—constituted what were conveniently termed the extracellular fluids. Recent work suggested that the osmotic pressure of the cellular fluids was roughly equal to that of the extracellular, but whereas the bulk of the cellular osmotic pressure was due to potassium ions, that of the extracellular fluids was due to sodium. Forced removal of water from the body or, better still, deliberate reduction of water intake to a minimum led to a state of generalized dehydration in which both kinds of fluids suffered and to the same extent. The volume of both fell and the osmotic pressure of both rose. The fall in the volume of the extracellular fluids prevented the normal exchanges of metabolites between the blood and the tissues and reduced the functional capacity of the kidneys. This state of generalized dehydration could be cured by the administration of water alone.

Forced removal of sodium from the body compelled the organism to compromise between reducing the volume of its extracellular fluids and allowing their osmotic pressure to fall. The fall in osmotic pressure further disorganized the kidney and in addition embarrassed the body cells by making them take up water in order to bring their osmotic pressure into line with that of the extracellular fluids. The only way in which the osmotic pressure of these fluids could be restored to normal and the comparative volumes of the cellular and extracellular fluids readjusted was by the administration of sodium salt and water. To give water alone was of no value. Saline must be given to all who had lost salt—that is to say, in all cases of diarrhoea and vomiting, heat-stroke, etc. It could be given by mouth or rectum or, most efficiently, intravenously. When the body was unable for any reason to excrete sodium salts their administration with water inevitably led to an increase in the volume of the extracellular fluids, and, if their administration was prolonged, to oedema. It was logical to restrict the sodium intake in these conditions, but relative salt deficiency might supervene insidiously, and if it did the treatment must be regarded as unsatisfactory.

The Potassium Level

Dr. R. S. AITKEN described a case of familial periodic paralysis in which reduction of potassium was a feature. The patient, a man of 21, had suffered typical attacks of paralysis of the arms and legs. The attacks occurred in the middle of the night and lasted for anything up to forty-eight hours. They occurred once every two or three weeks or oftener. A heavy meal shortly before bedtime was likely to bring on an attack, also the eating of a large quantity of sweets. The condition was thought to be connected with some disturbance of the electrolytes in the body, especially lactic acid, phosphorus, and potassium. It was found, however, that all the electrolytes before and after the attack were within normal limits, except potassium, which during the attack fell to about half its normal concentration in the serum—that is, about 9 mg. per 100 c.cm. instead of about 18. Potassium chloride given by the mouth was followed by the disappearance of the paralysis and the return of power to the limbs within about an hour. It was found that glucose induced an attack; also that insulin given at 11 p.m. brought about an attack at 4 a.m., which was cut short by the administration of 12 grammes of potassium chloride by the mouth. On glucose and insulin being given together the potassium in the serum descended precipitately and paralysis appeared and became complete so far as the arms and legs were concerned. Prostigmin had no effect on the paralysis, from which it might be concluded that the fault was not the same as in myasthenia gravis. The general conclusion was that in normal people sugar by the mouth, insulin by injection, sugar and insulin together, and adrenaline all produced moderate falls in the serum-potassium level. It was not known where the serum potassium went to out of the blood. In patients subject to periodic paralysis these agencies lowered the serum potassium to an unusual degree, and a flaccid paralysis came on, which with almost complete regularity was relieved within an hour by potassium chloride by the mouth. He was inclined to think that the lowering of the serum potassium was not the only condition necessary for the development of this peculiar form of paralysis.

Toxic Effects of Mineral Salts

Dr. C. L. COPE said that until recently mineral salts, although they had received attention from the pharmacologist, had been little regarded by the clinician. One important precaution to be observed in administering them was to have regard to the effect of the radical with

which the salt was combined. One patient with some form of haemorrhagic disease was treated with large doses of calcium, and the physician attending him, knowing that the most readily absorbed salt of calcium was the chloride, administered that in considerable amount. Most of the calcium was excreted in the bowel, leaving, however, what was in effect hydrochloric acid in the body, resulting in a severe acidosis. If the lactose had been used all would have been well. The reason why such troubles did not occur more frequently was the efficiency of the normal organs of excretion, especially the kidney. The absorption of any salt tended to upset the ionic balance of the body fluids, and the kidney attempted to rectify the upset. When the excretory mechanism was impaired difficulty was likely to arise in mineral-salt therapy. For example, in pre-insulin and early insulin days much sodium bicarbonate was administered to the diabetic to combat acidosis, and cases of generalized oedema appeared to have been more frequent among diabetics then than they were now. The inference was that the oedema was due to the giving of too much sodium. Potassium also had its toxic action. Potassium citrate was given to nephritic patients to render the urine alkaline. If in such patients there was severe renal functional damage, then the urine would not so readily be made alkaline, and in those circumstances there was a temptation to increase the dose of potassium citrate, rendering the conditions very suitable for the development of potassium poisoning. The use of either potassium or sodium citrate in renal damage was liable to lead to another ill result. An excess of the alkaline ion was liable to be left behind in the body, with the result that alkalosis was produced, and if the kidney was damaged the alkalosis might remain unrelieved.

Another supposedly innocuous substance was magnesium, which was given in large amounts as the sulphate for its effects as a purgative. When a full magnesium dose was given to a person with healthy kidneys some went into the blood stream and was excreted rapidly, but when renal function was damaged it was a different story. The normal level of the magnesium in the plasma was very constant at about 2 mg. per 100 c.cm. of blood. But if in a severe nephritis the full purgative dose of magnesium sulphate were given the plasma magnesium might rise considerably, even to 10 or 15 mg. per cent. He wondered how often coma had been precipitated by a well-meant dose of Epsom salts. An important feature of the clinical condition in such cases was depression, mental lassitude, irritability, and drowsiness, precisely the symptoms to be expected in mild magnesium poisoning. Vast amounts of stomach powders were taken by sufferers from various types of indigestion, in many cases not under medical supervision, and these patients remained in a state of depression due to the continuous ingestion of magnesium. Referring to calcium, Dr. Cope said that in the majority of individuals this was satisfactorily dealt with, and in a series of patients with gastric ulcer under treatment with alkalis containing calcium carbonate there was no sign of retention. But when alkali poisoning did develop in such individuals the calcium in the blood was greatly increased. He had found such values as 16 to 18 mg. per cent. instead of the normal 10. He was not prepared to say that such high blood-calcium levels did definite harm, but a certain proportion of persons taking powders for stomach complaints did suffer from high blood calcium, and the possibility that the prolonged taking of large amounts of calcium might in time have a serious effect on the kidney was at least worthy of consideration.

Excess Iron and Rickets Causation

Dr. J. F. BROCK said that it was now possible to state definitely that one mineral when present in excess in the diet could interfere with the absorption of another mineral and cause deficiency. The simplest way to produce experimental rickets in rats was by the Steenbock diet, in which the amount of calcium was much increased in relation to the amount of phosphorus. Some years ago he was impressed with the possibility that large doses of iron might have a similar effect, and he discovered that diets containing a considerable excess of iron could produce in rats exactly the same type of rickets. The reason for this was that the excess of iron present in the gastro-intestinal tract precipitated phosphorus in the form of insoluble phosphate and gave the rat a phosphorus deficiency. Rickets could be produced not only with an excess of ferric chloride but with any iron preparation, and it had been recorded in various countries that the same sort of rickets resulted when other minerals—magnesium, beryllium, strontium, and aluminium—were added in excess to diet. Applying these principles to man, he had attempted to find out whether the ordinary large therapeutic doses of iron that were used to-day might have any effect on the human phosphorus metabolism. He found that consistently the addition of large quantities of iron caused an excess of phosphorus excreted in the stools. But with the ordinary conditions of diet, notwithstanding the high iron dosage, there was also such an excess of phosphorus as to cause no danger of deficiency at all. In one patient, however, who was on a very low phosphorus diet, the stool phosphorus was raised by the addition of large quantities of iron, and the effect was to bring about a negative phosphorus balance. He was not suggesting that any person had been given rickets as the result of the therapeutic administration of iron. The amount of iron given therapeutically would never cause anything beyond a transient deficiency in the phosphorus. But if the ratio of Fe to P were raised over a certain critical level a deficiency was caused.

Sir WALTER LANGDON-BROWN referred to some French observations to the effect that myasthenia gravis was caused by an adenoma in the thymus, in the same way that hyperparathyroidism caused von Recklinghausen's disease. The biochemical effect of this adenoma was that it raised the sodium content and lowered the potassium, so that good could be done by giving potassium salts and harm by giving sodium—just the reverse of the conditions obtaining in Addison's disease. He thought that the danger of taking alkaline powders in large quantities was one which should be recognized. Dr. E. N. ALLOTT said that, where there was dehydration to begin with, hypertonic saline was a very dangerous drug. It had its advantages, but it should be used with great caution. He also stated that he had had the opportunity at Cambridge of investigating two further cases of familial periodic paralysis of the kind that Dr. Aitken had brought forward. It could be said quite definitely that the potassium in these cases did not go out in the urine; it was retained in the body. The present interpretation of the facts was that for some unknown reason there was an abnormal demand on the potassium in these affected subjects, and that the fall in serum potassium was a reflection of that. Some neuromuscular abnormality as well as some abnormality in dealing with potassium must be postulated.

Salt and Fluids in Treatment of Aural Vertigo

Mr. TERENCE CAWTHORNE referred to cases of aural vertigo. It had been stated that in these cases the attacks of vertigo diminished on the reduction of the water and the salt intake, and that the hearing was very much improved. More recently it had been affirmed that with a sodium-free diet these patients could take unlimited water and did not get vertigo. He had tested the matter out in seven typical cases. The fluid intake was increased, but the vertigo, tinnitus, and deafness were made much worse. The fluids were then cut down to 20 oz. a day in four cases, and in the three others, which could not tolerate that low level, to 30 oz. In six out of the seven cases the vertigo disappeared; the tinnitus went in five, and in a sixth was very much better, and the measure of

the hearing showed improvement in all. They were tried with a salt-free diet, but the results were not so striking as with the water exchange. The salt-free diet seemed to accentuate the good effects of reducing the fluids, but with a salt-free diet an increase of fluids still caused bad symptoms. He had come to the provisional conclusion that the water was the important thing, although probably if one continued with the salt-free diet, and perhaps took other steps to eliminate sodium, that might result in improvement also.

The PRESIDENT (Dr. Tidy), in summing up, said that the right side of the heart must have an important part to play in the interchange of fluids. Any weakness of action there must come particularly into play when there were differences in the volume of the fluids in the body. Perhaps the plasma proteins and the part they took in this interchange had not been sufficiently considered. He wondered whether it was right to lump together, as Dr. Drummond had done, the fluids in blood, lymph, and intercellular spaces as extracellular fluids. Surely there was a distinct difference between those fluids which were contained within the vessels and those which were outside. It seemed to him an artificial division, and he also wondered whether it was right to say that the osmotic pressures of the cellular and extracellular fluids were identical. It seemed to him a very big supposition, and against probability. He added that he had had two cases of aural vertigo, to which he gave a salt-free diet. The intake of water was not controlled. Neither of those cases benefited at all.

MEASLES: EPIDEMIOLOGY AND PROPHYLAXIS

At a meeting of the Section of Epidemiology and State Medicine of the Royal Society of Medicine on February 25, Sir ARTHUR MACNALTY presiding, the subject of discussion was measles, to which Dr. J. A. H. Brincker, principal medical officer of the London County Council, contributed a historical, epidemiological, and aetiological study, and Dr. William Gunn an account of serum prophylaxis.

Dr. BRINCKER, in a short historical survey, said that the disease could not be recognized as such in any writings before Rhazes (tenth century). It was not until the sixteenth century that measles was accepted as an infectious disease. Even at that time there was still great confusion between measles and small-pox, and Thomas Phayre, in his *Book of Children* (1553), writing of "small pockes and measils," said that "this disease . . . is of two kinds: varioli, ye measils: and morbilli, called of us ye small pocks." Up to the eighteenth century the words "morbilli," "rubiolae," "blacciae," "lenticula," "rossalia," and "rossania" were all mentioned in medical books, and there could hardly be any doubt that the present disease measles was referred to by those words. It might be assumed that in earlier times the exanthemata, at any rate measles and small-pox, were so common that they coexisted and often attacked the child at the same time. Sydenham gave a very clear description of measles epidemics in London in 1670 and 1674. In the first half of the latter year London was affected by a measles epidemic causing 795 deaths, and in the second half by one of small-pox causing 2,507 deaths. Sydenham hinted that many more deaths must have been indirectly due to measles, though they were registered under such headings as "convulsions," "diarrhoea," and "consumption."

Geography and Periodicity

Measles was met with in all countries and climates. It might be rarer in some than in others, but this was due not to latitude but rather to the accident of isolation from the densely populated communities where the disease was endemic. In London and in other cities both in this country and on the Continent it recurred in epidemic form at regular intervals. The interval in London was two years. Usually this biennial epidemic began at the end of October, but its effect, as regards both incidence and mortality, did not become appreciable until the middle or end of the following January. Both then increased rapidly, to reach their maximum in April or early May, and then there was a rapid fall until the epidemic exhausted itself by the end of June. In temperate countries epidemics were more frequent in the colder than in the warmer months, but severe epidemics had been reported in the middle of summer in such countries as Spain and South Russia. Variability in the severity of outbreaks had been recorded in London and other English towns from time to time. In communities which had been long free from it measles might become widespread, severe, and associated with a variety of complications, and produce a very high mortality. There had been numerous epidemics where the mortality was for one cause or another excessively high—for example, in the Fiji Islands in 1875, when between one-fifth and one-quarter of the population died from measles or its consequences, and among the women and children in the Boer concentration camps in the South African War.

Turning to aetiology, Dr. Brincker said that the infecting agent or virus was known to be present in the blood of the sufferer during the period of invasion and perhaps up to the second day of the disappearance of the rash; thereafter it was irrecoverable from the blood and rapidly disappeared. Immunity due to the development of specific antigens rapidly took place in the body tissues, and these were present in the patient's blood soon after convalescence. Convalescent measles serum obtained from such a person might be used either to prevent an attack or to modify the disease in a person already infected with and incubating it. Infants at the breast had a high resistance to infection, possibly due to antigens derived from the mother. Children from 18 months to 2 years of age, on the other hand, were highly susceptible, and this susceptibility existed until about the fifth year, after which it diminished. These years of a child's life were also those during which it was susceptible to other diseases complicating measles, such as bronchopneumonia, and therefore the mortality at this age was significant. The question of prophylactic vaccination against the disease was still unsolved, but as success had already been obtained in such diseases as small-pox, distemper, and rabies, it was quite possible that this would before long be the case as regards measles.

Incidence and Mortality

So far as London was concerned, there had been a definite reduction in the death rate of measles since the eighties of the last century, and this became more pronounced during the first three decades of the twentieth century. Dr. Brincker showed the following table giving the death rate in London per million of population:

	Males	Females
1851–1860	578	493
1871–1880	558	463
1891–1900	631	539
1911–1920	417	308
1921–1930	192	146
1931–32	128	88
1933–34	130	96
1935–36	85	61

A big decline in mortality began in 1920 and had continued ever since. This drop in mortality was sometimes ascribed to the falling birth rate, but that could not be the case, for the number of cases of measles reported from the schools during every biennial epidemic remained the same. The diminution in the number of deaths must be ascribed to the general improvement in child health, also to the fact that both parents and teachers had come to recognize the disease as a serious one.

In spite of the fact that measles in this country was an endemic disease there were quite a number of isolated communities where it was non-existent, and when it was

accidentally introduced it behaved like a new disease and affected the susceptibles in that closed community until they were exhausted. At the other extreme, in an urban community like London, where the disease recurred as regularly as clockwork every two years, one could almost predict the very week in October when the disease became epidemic and began to spread from district to district and school to school. In New York the periodicity curve of measles appeared to be undergoing a state of evolution similar to that experienced in London in 1912–18. Two successive years of epidemicity were followed by one of non-epidemicity, and these by an epidemic year followed by a non-epidemic one, and then the curve repeated itself by a succession of two epidemic years followed by one of non-epidemicity. What was responsible for this "break-step" phenomenon as well as the persistent lower mortality of measles in New York when compared with that in London could not as yet be explained. Dr. Brincker showed a table giving the figures for New York since 1910, with the comparative figures for London. The figures for the last eight years were as follows:

Year	New York		London	
	Deaths	Death Rate per 1,000	Deaths	Death Rate per 1,000
1930	154	0.02	1,027	0.23
1931	134	0.02	115	0.03
1932	58	0.01	822	0.19
1933	213	0.03	101	0.02
1934	25	0.00	855	0.20
1935	105	0.01	19	0.00
1936	81	0.01	584	0.14
1937	25	0.00	25	0.01

Serum Prophylaxis

Dr. W. GUNN, medical superintendent of the North-Western Fever Hospital, said that at present in this country only the fever hospitals held stocks of convalescent serum, which was usually available in small amounts to public health authorities and to private practitioners. Much larger stocks of adult measles or normal serum were maintained by general and fever hospitals and by certain public health authorities. At least two commercial firms which specialized in the manufacture of biological products made, or were prepared to make, immune measles serum from blood collected under proper conditions by private practitioners or public health authorities. Placental extracts had been prepared by the Lister Institute and by the L.C.C. serum laboratories, Belmont. He touched on difficulties not yet solved—namely, the estimation of serum potency, the determination of the fact of invasion following exposure, and the problem of human controls, including the disturbing factors of chance and latent immunization by subclinical attack.

After showing some tables, Dr. Gunn said that it would be deduced that those concerned were rather disappointed in their results, which seemed to get worse with each epidemic, instead of better. The probable explanation was twofold. It related first to the selection of donors. When the work started this selection was most carefully done, but with an increasing number of workers the same care was not always exercised, and sometimes cases of rubella in adults crept in. The second reason was that not enough care was taken in the recording of the data, so that as the scope and range of the investigations extended the reliability of the results diminished. He was afraid that the scope of the method would not be greatly improved until, first, the serum was readily available at all times when required, and, secondly, deliberate exposure was practised whenever circumstances called for it. Whether legal consent to the practice of prevention and attenuation of measles by serum was necessary in hospital work was a matter of opinion. The consent of the parents or of those *in loco parentis* should always be obtained if possible, but if this would result in undue delay one should proceed without it. The legal aspect of inoculating children without consent had not yet, so far as he knew, come before the courts, but it might well come about that failure to use the method would at some time or other be accounted negligence, and therefore one was between the devil and the deep sea.

Discussion

Sir ARTHUR MACNALTY said that Dr. Gunn had alluded to an early report of his which he worked on more than twenty years ago, when they were all very much concerned to reduce the mortality of measles. The main recommendations made at that time were to impress upon parents the seriousness of measles as a disease, to endeavour as far as possible to prevent the child contracting the disease before the age of 5 years, to ensure precautions being taken in the home against the complications, especially respiratory, of measles, and to emphasize the grave after-effects through lack of attention to the eyes and ears. These instructions from the Local Government Board did gain a wide circulation through the efforts of school nurses and health visitors, and the position had been greatly improved by the measures for infant and child welfare. It was to be hoped that the further researches, such as Dr. Gunn had carried out, would reduce the mortality to a still greater extent.

Dr. J. E. MCCARTNEY said that the donors of serum at L.C.C. institutions were healthy adults. So far as was known no untoward result had followed the administration of the serum. Well over 100 litres had been used. Had any form of virus infection taken place the fact would have been notified. Dr. W. A. DALEY asked whether the progressive reduction in the death rate from measles was due to the fact that the virus had changed in its potency. Was measles like small-pox in the respect that there were viruses of different character or strength? Was the improvement due to the increased resistance of the individual to attack or to the efforts made to impress parents that complications should be prevented? Further, did chill in itself precipitate an attack of bronchopneumonia, and what was it that caused some children to develop bronchopneumonia while others escaped? Measles had been known for many hundreds of years, but yet he felt that the knowledge of the subject was still somewhat patchy. Dr. R. A. O'BRIEN referred to the difficulty of ensuring a supply of serum. There was a wave of measles all over the country at present, and there were agitated demands for the serum which was not available. Convalescent serum was difficult to get, and there was no central organization for obtaining adult serum. Dr. RICHARD HAMBURGER said that bronchopneumonia was the principal danger for the younger child, and the high incidence of this condition might perhaps be explained by the fact that these children were always lying on their back during their illness, and thus a hypostatic state was favoured.

Dr. S. MONCKTON COPEMAN, as a member of the London County Council, spoke of the administrative problems which the biennial epidemic of measles, now at its height, imposed. He also said that an endeavour was being made to bring into force the general notification of measles in London. It had been suggested by opponents of compulsory notification that it would mean more cases coming under the care of the authorities, and therefore the difficulties of hospital accommodation and nursing would be increased. But it might, he thought, have the opposite effect, because if, as a result of notification, cases could be dealt with in the extremely early stages, extension in the home or school might be prevented and thus the total numbers would be lessened.

MASCULINE FEMALE PELVES

A meeting of the North of England Obstetrical and Gynaecological Society was held in Manchester on January 28, at which Dr. JOHN CHISHOLM took the chair in place of the retiring president, Dr. J. W. BRIDE.

Mr. PERCY MALPAS (Liverpool) read a paper on the masculine pelvis in women. He said that Caldwell and Molloy considered that the main characters of the "android" pelvis were a forward displacement of the sacrum, causing shortening of the posterior segment of the inlet; relative straightness of the ilio-pectineal lines, which pass backwards from the pubes at an acute angle, giving rise to a narrow fore-pelvis; and a tendency for the sacrum to be vertical. Thoms, in 1933, described a series of cases in which transverse narrowing of the inlet was found in association with occipito-posterior positions, and he considered that many of these pelves belonged to the male type of the inverted pelvis of Berry Hart. Hart's papers represented the most important contribution to the subject of the masculine pelvis. He thought that either the ilio-sacral or the ischiopubic segments of the female pelvis might undergo inversion into the male type. An important aspect of Hart's cases was that the patients exhibiting pelvic inversion also showed other evidence of pseudo-hermaphroditism. The characters of the masculine pelvis in women were still far from decided. Many of the anatomists' criteria were not applicable in obstetrical practice, and the relationship between the assimilation pelvis and the masculine pelvis still required elucidation. Three recent cases had called his attention to the problem.

CASE REPORTS

The first patient, a primigravida, was admitted for a persistent occipito-posterior position, which necessitated a forceps rotation. Extraction was difficult on account of antero-posterior as well as transverse contraction of the bony outlet. The iliac bones were small with the rough incurved crests seen in the male pelvis; the sacral promontory could not be reached. Lateral radiographs showed an extension of the sacral articular surface on to the third sacral vertebra, a long six-piece sacrum due to low assimilation, and a false promontory between the first and second sacral vertebrae. The patient was tall and heavily built, with pronounced hirsutes and a general male distribution of body hair.

The second patient had a persistent occipito-posterior position in her first labour, which lasted eighty-one hours and ended in a stillbirth. Her second labour was normal. She had the heavy, incurved, small iliac crests characteristic of the male pelvis. *X*-ray pelvimetry showed all the measurements of the brim to be the same, the sacral curvature was increased, there was low assimilation, and the angle of inclination of the brim was greater than normal. The patient had hirsutes, which she concealed by shaving, and a general male distribution of hair.

The third patient, as yet undelivered, also exhibited hirsutes and a male type of hair distribution. The iliac crests were of the male type. Radiographs revealed the brim of the pelvis as circular, the sacrum showed low assimilation, was articulating with the ilium by two and a half pieces, and had a well-marked false promontory. The angle of inclination of the brim was raised.

Mr. Malpas considered that evidences of sex intermingling other than those in the pelvis should be taken as a criterion in the selection of cases from which the features of the masculine pelvis were to be worked out. The main characteristics appeared to be a vertical or forward-curving sacrum, low assimilation making a six-piece sacrum, an increased angle of inclination of the brim, and a well-marked false promontory. While contraction of the outlet was probably of importance, its measurement was more difficult than was generally supposed; antero-posterior bony contraction had not received as much attention as it deserved when compared with transverse contraction. Pelves of the masculine type were undoubtedly responsible for some cases of persistent occipito-posterior position.

At the same meeting Mr. F. J. BURKE (Liverpool) described a granulosa-celled tumour of the ovary occurring in a woman aged 54; Dr. E. A. GERRARD (Manchester) discussed two cases of large tumours complicating pregnancy, one a large par-ovarian cyst and the other a large pedunculated subserous fibroid; Dr. W. W. WRIGHT (Stoke-on-Trent) read notes on a case of locked twins associated with toxic albuminuria and profound intrapartum collapse; and Professor DANIEL DOUGAL recorded a case of incomplete cervical abortion. In the discussion which followed Professor A. H. CLAYE, Professor MILES PHILLIPS, Miss RUTH NICHOLSON, and Mr. F. H. EDWARDS took part.

DIABETIC OUT-PATIENTS

The management of diabetic out-patients was discussed at a meeting of the London and Home Counties Branch of the Medical Superintendents' Society on January 20.

In opening Dr. H. P. HIMSWORTH quoted certain American statistics and a prophecy that diabetes is likely to be as prevalent as pulmonary tuberculosis within a few years. In 1936 the deaths in this country from diabetes were as numerous as those from all the infectious diseases together. The number of patients attending his own clinic at University College Hospital was increasing by 200 every year; the total admissions last year were sixty-five, out of 900 attending. One hundred more patients were scattered about in other departments of the hospital, and perhaps half of these were admitted. An efficient clinic was essential, and having one man in charge secured continuity of treatment and helped to gain the confidence of patients.

Organization of a Diabetic Clinic

Four important requirements of a diabetic clinic he discussed briefly. First, a dietitian, who should be able to explain a dietary to the patient in simple language, paying due regard to his or her economic position. Secondly, a technician was needed for analysis of urine. Dr. Himsworth did not approve of casual blood-sugar estimations; glucose-tolerance curves were essential in many cases for diagnosis. He placed great reliance on the ferric chloride test for acetone bodies. The nitro-prusside test, positive at about 1 in 400,000, was very sensitive, but a positive ferric chloride reaction, given at a concentration of about 1 in 1,500, provided a most useful warning of imminent coma and was an indication for immediate admission. Thirdly, the services of a chiropodist should be obtained; in his two years' personal experience of such an arrangement the incidence of gangrene had been halved. Lastly, the chest should be *x*-rayed at the patient's first attendance, and annually thereafter. The rate of incidence of pulmonary tuberculosis was 6.5 per cent. and the condition was most common in the 45 to 50 age group. Prognosis was at least as good as in non-diabetics if the diabetes was controlled and the pulmonary disease diagnosed early. Clinics could be relatively centralized and could deal with about 100 patients in one session, about six being new cases. The co-operation of the district nursing association was of great importance.

On admission, if the ferric chloride test was positive and if the patient could swallow, 50 grammes were given by the mouth and 25 units of insulin were injected every three hours till the urine was free from acetone bodies. Diets were weighed daily at first, later weekly. Actual menus were provided by the dietitian, about half a dozen alternatives being possible for each meal. Treatment was by diet alone for the first week if there was not much

acetonuria. Insulin was given if acetone was present in the specimens of urine taken before and after breakfast.

Factors in Prognosis

Dr. B. A. YOUNG emphasized the importance of estimating the prognosis of a diabetic in relation to (1) his financial position, (2) his intelligence, and (3) the skill of his medical attendant. The increase in the number of diabetics over the age of 50 was due to the ageing of the population in general, and to the increased duration of life of diabetics. He referred to the difficulty under some authorities of securing any reasonable degree of continuity of treatment. He mentioned the general practitioner's appreciation of information relating to the dosage of insulin, the dietary, etc. He advocated periodic lectures for district nurses, and stressed the importance in poor localities of high carbohydrate diets, owing to their cheapness as compared with high fat or protein diets.

Dr. Young exhibited models used by him to illustrate portions of different foodstuffs, which he had found of value in the treatment of the less intelligent diabetic. Definite schemes for large municipal authorities were advocated with clinics centralized to promote continuity and standardization of diabetic treatment.

Local News

SCOTLAND

Edinburgh Medical Officer of Health

The Public Health Committee of Edinburgh has unanimously recommended the appointment of Dr. William George Clark, at present deputy medical officer of health for Edinburgh, to succeed Dr. John Guy, who is due to retire from the post of medical officer of health for Edinburgh in October. Dr. Clark graduated M.B., Ch.B. at Glasgow in 1910 and took the D.P.H. of Cambridge in 1920. After holding posts as house-physician and house-surgeon in Glasgow Royal Infirmary and assistant medical officer in the Belvedere Hospital, Glasgow, and Brook Hospital, London, Dr. Clark became assistant medical officer in Woolwich Tuberculosis Dispensary and was later appointed assistant medical officer of health in Glasgow. From this post he was appointed deputy medical officer of health for Edinburgh in August, 1935. It was agreed by the Public Health Committee that the salary should be at the rate of £1,500 per annum rising by five annual increments of £50 to £1,750. It was also resolved that the medical officer of health might, with the consent of the committee, accept any appointment as professor or lecturer in connexion with the instruction of students, provided this did not interfere with the discharge of his primary duties.

Edinburgh Royal Medical Society

The annual dinner of the Royal Medical Society of Edinburgh, now in its 201st year, was held on February 24, Dr. G. J. Cleland, senior president of the society, presiding. Mr. W. J. Stuart, in proposing the toast of "The Royal Medical Society," reviewed the changes that had taken place in clinical teaching during the past forty years. He felt that at the present time students did not get enough to do in the wards. Mr. John R. Little, chairman of the managers of the Royal Infirmary, replying to the toast of "The Royal Infirmary," said that its principal difficulties at the present moment were financial, although they also greatly lacked adequate publicity. The Infirmary was not a parochial but a national institution, receiving patients from all over Britain and indeed from distant countries. It had grown in size and in efficiency, and while the annual cost in 1914 had been £60,000, in 1937 it was £180,000. The new extensions would mean still greater cost.

Glasgow Rheumatic Clinic

Speaking at the annual meeting of the Glasgow Orthopaedic and Rheumatic Clinic on February 24 Sir Hector Hetherington, Principal of the University, said that the morbid conditions with which this institution was concerned were receiving more and more attention from the public, the medical profession, and medical science. It was certain that there were few cities and districts which had a greater need of this service than Glasgow and the western district of Scotland. By reason of the climate and of the nature of the main industries, illness and accident in that area called for treatment by the methods offered in the institution. They were discovering to-day that a higher standard of physical well-being was possible, and that to remedy conditions which did not seem at first sight to be very serious added greatly to human efficiency and happiness. The report of the institution showed that 3,044 patients had been treated during the year, involving 104,700 separate treatments. The expenditure had been £6,300, to which the patients themselves had contributed about £5,000.

ENGLAND AND WALES

Rheumatism Research in Leeds

The third annual report of the Leeds Advisory Committee on Research into Rheumatism has now been issued; it relates to the year 1937. Dr. D. H. Collins, the committee's research fellow, states that work is continuing on the reactions of the peripheral circulation in rheumatism to temperature influences. He mentions the great advantage conferred by the direct association of abundant specialized clinical material with the resources of the scientific departments of a university medical school. New apparatus and further technical assistance have been obtained for the histological study of rheumatic bones and joints, and the accumulated data from clinical and radiological examinations are expected to contribute to the fundamental pathological knowledge, which has been so scanty hitherto as regards rheumatism. Eight papers have been published during the last three years. A second research fellow, Dr. W. Goldie, was appointed last March, and a follow-up investigation was undertaken of cases of arthritis treated by gold injections at the Leeds Public Dispensary and Hospital. Research is now being conducted on the incidence of antibodies in the blood of patients with rheumatoid arthritis to the *Streptococcus haemolyticus* and other bacteria; the influence of gastric acidity on the incidence of toxic reactions in cases treated by gold; the excretion of gold in man; the blood changes produced by gold injections; and the investigation of a patch test for hypersensitivity to gold salts. An attempt is also being made to reproduce rheumatic lesions experimentally in animals by dietetic and infective means. Lord Harewood, chairman of the Advisory Committee, believes that the work of the committee is capable of considerable development in association with the Empire Rheumatism Research Council.

Co-operation in Health Services

Dr. Thomas Carnwath of the Ministry of Health, when opening the King's Lynn Health Week, paid a tribute to the work of the Central Council for Health Education in helping to organize the activities of the week. The last half-century, he said, had seen tuberculosis pass from being "normally incurable" to "normally curable," but only if treatment was begun in time. The standardized death rate from tuberculosis had declined from 2,453 per million in 1885 to 657 in 1937. It was still, however,

more fatal than any other single disease except cancer. It was necessary to impress on everyone the importance of seeking treatment as soon as there was reason to fear infection and of learning how to prevent the spread of infection. Venereal diseases were another scourge on which a special attack was being made at this stage of the health campaign. These diseases were particularly insidious in their effects. There was no sphere in which the perils of ignorance and neglect were more terrible or the spread of knowledge more necessary. It was essential that all cases should be promptly discovered and treated, and that the patient who was under treatment should persevere until his system was certainly free from the poison. The family doctor was still the first line of defence against ill-health, and his co-operation in helping to expand the health services was invaluable, just as the health services could also help the doctor—for example, the tuberculosis service. Co-operation was, perhaps, the most important requirement of all in the improvement of health and happiness.

Epsom College

The Council of Epsom College will shortly proceed to elect one or more St. Anne's scholars. Candidates must be fully nine years of age, and must be orphan daughters of medical men who have been in independent practice in England or Wales for not less than five years. The value of the scholarships is dependent on the means of the applicants, the locality and fees of the schools selected. Application must be made by May 1, 1938, on a form to be obtained from the Secretary of the College, 49, Bedford Square, London, W.C.1.

Appropriation of London Public Health Institutions

Six public health institutions under the administration of the London County Council remain to be appropriated for the reception of the sick. These are the Fulham, St. Mary Abbots, Hackney, St. Leonard's, St. Alfege's, and St. Pancras institutions. There are still some able-bodied healthy and infirm inmates in these institutions in addition to sick patients, but during the next few weeks all the former will be transferred to public assistance establishments, and by April 1 the appropriation of the six institutions will be effected. Each of them adjoins and is within the curtilage of a hospital of the same name. With the appropriation of these six institutions the Council has completed its task, first entered upon in 1929, of removing as soon as circumstances permitted its hospital service from the ambit of the Poor Law. After appropriation the whole of the available accommodation will be utilized for sick patients. Certain medical staffing arrangements are proposed, to be reviewed at the end of two years. The medical superintendents of the hospitals to which the institutions are attached have in five cases had an additional allowance as medical and administrative heads of the institutions, and this is now to be incorporated in the basic salary in four of the cases and to be subject to the usual increment. In the fifth case, that of Hackney Hospital, the scale of salary of the medical superintendent is £1,200-£50-£1,450, and an additional allowance of £50 a year has been received in respect of the institution. On appropriation the combined institution will provide accommodation for a large number of sick patients, approximating to that of Lambeth Hospital (1,250), and the scale of salary is to be the same as for Lambeth Hospital—namely, £1,400-£50-£1,650. In three of the institutions the position ranking next to that of the medical superintendent is to be upgraded.

It was announced in the *American Heart Journal* for December, 1937, that this was the last issue to appear under the editorship of Dr. Lewis A. Conner, under whom the journal has arrived at its present high position. He has been succeeded by Dr. Fred M. Smith, Professor of Medicine in the State University of Iowa.

Correspondence

Raw or Pasteurized Milk

SIR,—The important question, Should raw or pasteurized milk be given to children? is much to the fore at the present time, and although the medical profession generally is strongly in favour of pasteurized milk, governmental action has long been delayed. It is true that the Board of Education has repeatedly urged that efficiently pasteurized milk, where such is available, should be supplied in schools; and that the Government has announced its intention of introducing legislation which will enable local authorities, if they so wish, to secure that all but tuberculin-tested milk is pasteurized in their areas. This is a minimum measure, and it is to be hoped, therefore, that the Government's proposals will be in no way weakened during their passage through Parliament.

Any lingering doubts should be removed by the report from the *Journal of Dairy Research* for October, 1937, by Wilkie, Edwards, Fowler, and Wright on the relative value of raw and pasteurized milk in the feeding of calves, from which I quote the following from the "summary and conclusions":

1. Bull calves from tuberculin-tested Ayrshire herds were fed on raw or commercially pasteurized milk up to 12 weeks of age, in amounts strictly in relation to their body weight. This diet was supplemented from the eighth week by hay at the rate of 2/3 lb. per head per day. The milk used was mixed milk from untested herds, the raw and pasteurized milk being derived from the same bulk sample.

3. No appreciable differences were noted in the skeletal growth of the two groups. Marks awarded by experienced stock judges showed consistent differences in favour of the pasteurized-milk-fed group, although the significance of such differences cannot be assessed.

4. Inoculations of grouped daily aliquots of raw milk twice weekly into duplicate guinea-pigs resulted in finding viable tubercle bacilli in 70 per cent. of the samples, and *Br. abortus* in 38 per cent. of them. The pasteurized milk samples were uniformly negative to both tests.

The differences in tuberculous infection of the two types of milk were reflected in the results of tuberculin tests and post-mortem examinations on the calves at the conclusion of the experiment. Twenty-four out of thirty-six calves fed on raw milk reacted to the test, and the presence of tuberculous lesions was confirmed in twenty-three by post-mortem examination. One calf in the pasteurized-milk-fed group reacted to the test, but exhaustive post-mortem examination and inoculation of glandular material into guinea-pigs failed to confirm the presence of any tuberculosis.

5. This work has failed to show any significant differences in the nutritive value of raw and of pasteurized milk for the rearing of young calves. The use of pasteurized milk, however, had a clear advantage in that it preserved the animals from infection through drinking milk containing living tubercle bacilli.

Again, in the report on tuberculous disease in children by John W. S. Blacklock (issued by the Medical Research Council in 1932) we find it stated:

"Of twenty-eight cases of tuberculous cervical adenitis, ten were infected with the human type of bacillus and eighteen (64.3 per cent.) with the bovine. . . . In twenty-six cases of tuberculosis of bones and joints, seventeen were due to infection with human strains and nine (34.6 per cent.) with bovine, the incidence of the latter being practically the same in town and country."

It will be remembered that within the last two years the Royal College of Physicians reported its unanimous opinion in favour of all milk sold in Great Britain being

pasteurized, and suggested that even Certified and Grade A milk should be similarly treated as a counsel of perfection in the interests of the public.

We have all seen cases similar to the following.

A few years ago a lady consulted a paediatrician about her child, who was going for a holiday on a farm. He told her that it was necessary for the child's milk to be obtained from the mixed milk of at least three cows, and essential that it be boiled before use. The reasons were explained to the mother. Upon arrival at the farm the mother saw a cow which she described as having a kind and pathetic face, and arranged for the milk from this cow alone to be given to her child. Unfortunately it was given raw, after all the injunctions to the contrary. Within four months the child was dying of generalized tuberculosis, although previously there had been no indications of this disease. The cow was killed and found to be riddled with tuberculosis.

The evidence in favour of all milk being pasteurized is overwhelming, and I have no doubt that at no distant date the sale of any milk other than pasteurized will be looked upon as a criminal offence, as it is a safe milk and its nutritive value is fully equal to raw milk.

It is the duty of every authority or other body responsible for the health of the people living within its area to consult the medical officer of health attached as to what procedure is essential, and I have no doubt that the medical officers of health, who have all the knowledge and experience necessary to form an unbiased judgment, would give a very decided lead in favour of universal pasteurization of milk. With tuberculosis so rife it is important that strong action should be taken immediately by all those responsible (including Government action) for the supply of pure and safe milk to the inhabitants of Great Britain. Hesitation should be unthinkable.—I am, etc.,

London, W.1, Feb. 21. BERNARD MYERS.

Insulin-tannic-acid-zinc Suspension

SIR,—The observations of Drs. C. N. Jenkinson and K. J. G. Milne on the above new compound published in the *Journal* of February 19 (p. 380) call for a few remarks. They conclude (1) that the compound is unpleasantly painful to most patients, but (2) that otherwise it shows retarding qualities similar to those of zinc-protamine-insulin, and "can effectively replace zinc-protamine-insulin in the treatment of diabetic patients." With the first conclusion I am in painful agreement, as I injected an experimental tannic-acid-insulin preparation into myself about a year ago to my intense discomfort. With the second claim I cannot agree after a careful study of the details of the nine cases in Table I, which hardly support their conclusion but in my opinion contradict it. For instance, in Cases 1 and 2 no fasting blood sugars are given to show the retarding effect after twenty-four hours, and in Cases 3 and 4 the fasting blood sugar shows the prolonged effect of zinc-protamine-insulin to be greatly superior. Cases 5, 6, 7, and 9 are too mild to show any clear comparison, as the fasting blood sugar is nearly normal with all types of insulin; and in Case 8 the doses of insulin are insufficient to show any effect, and all the fasting blood-sugar concentrations are equally high. I regret to be so sweepingly critical, but I have considered all the nine cases. Moreover, a study of the blood sugar at three to six hours mostly shows the new compound to act more quickly and strongly than zinc-protamine-insulin. I believe my reading of the authors' figures to be fair. Protamine is cheap enough, and I doubt whether the point they make that tannic acid is cheaper still would count for much in their commercial price.—I am, etc.,

London, W.1, Feb. 21. R. D. LAWRENCE.

After-effects of Modern Treatment of Carcinoma

SIR,—I was much interested in Mr. Percy Furnivall's description of the results of *x*-ray therapy as illustrated by his own personal experience (*Journal*, February 26, p. 450). I have often advised patients suffering from various forms of malignant disease to submit to *x*-ray treatment, and in a considerable proportion of cases the results, so far as the actual tumour is concerned, have been satisfactory. I have been dismayed, however, to note that all too often the general state of the patient after this form of treatment has been lamentable.

An early case of breast cancer in a woman in the late thirties was treated by surgery followed by repeated exposure to *x* rays. Two or three years after this treatment had ceased she presented the dried-up "wizened" appearance of a very old lady. She had been a particularly "alive" woman and strove frantically to keep in touch with her many interests, but her physical state proved too much for her and life became devoid of all interest. She lingered on for ten years, and then developed a tiny carcinoma in the shrunken remnant of the remaining breast. This was removed, but twelve months later there appeared many subcutaneous nodules and the patient died.

This case is an outstanding example of the devitalizing results which I have again and again seen following *x*-ray therapy, especially in cases in which repeated full doses of *x* rays have been administered. Radium beam therapy appears to be replacing to an increasing extent treatment by the insertion of radium, but I fear the effects of this method are likely to be as disastrous as prolonged *x*-ray therapy has sometimes been. My radiologist friends can tell me of no experimental work on animals which is being done with a view to discovering what effect on general well-being the exposure to repeated doses of *x* rays has on healthy individuals. I should be glad to know if any of your readers can give any information on this point. I feel sure that the best type of individual has little use for a life which is a mere existence, and if research should indicate that repeated exposure to *x* rays spread over a long period of time produces senility within a year or two, then probably this form of treatment should be discarded in favour of methods which get it "over and done with" quickly. It is known that ultra-violet rays produce senile changes, and there seems reason to fear that *x* rays do the same in a much greater degree.—I am, etc.,

Bradford, Feb. 26. JAMES PHILLIPS.

Infantile Pyloric Stenosis

SIR,—Mr. David Levi, in his criticism (*Journal*, February 26, p. 486) of Dr. J. Vernon Braithwaite's communication on the treatment of infantile pyloric stenosis by antispasmodics (February 12, p. 334), would seem to have overlooked the fact that by the use of eumydrine or other antispasmodic, hospitalization of the infant, which, as he truly says, is fraught with no little danger, becomes unnecessary. Indeed, this to my mind is one of the great advantages of the eumydrine treatment. It is so simple that it can be easily carried out at home. It consists merely in the administration before the feeds, breast or bottle as the case may be, of the drug in an aqueous solution, in bulk amounting as a rule to no more than one teaspoonful.

I also think that Mr. Levi underestimates the efficacy of the eumydrine method of treatment. In my experience it is as good as any other, surgery not excepted. The last six examples of hypertrophic pyloric stenosis admitted

under my care to the Princess Elizabeth of York Hospital for Children have all been treated with eumydrine and with uniformly successful result, the vomiting in no case having persisted longer than ten days after its inception. While not in any way wishing to detract from the success which follows surgical intervention, as revealed in Mr. Levi's series, I should be astonished if such excellent results are the experience of the average paediatrician with surgical measures. At any rate, when I review all the examples I have had submitted to operation, the mortality rate is much higher than the 2 per cent. obtained by Mr. Levi. And I might further add that I have compared the results of surgical and medical treatment in cases from the same class of material (as, for example, hospital or private), and find that there is no difference in the recovery rate.

If I personally had any criticism to make of Dr. Braithwaite's communication it would be regarding the basis on which he made his diagnosis. From the evidence supplied by Dr. Braithwaite I should be doubtful if all his patients were in reality suffering from hypertrophic pyloric stenosis. Dr. Braithwaite did not depend, as I think most paediatricians would, on the presence of a palpable tumour, but he took as the pathognomonic feature the radiological findings, which of all the signs of the disease are the most fallacious. Anyone who takes the trouble to submit a series of infants with and without hypertrophic pyloric stenosis to a radiological investigation will discover that there is such variation in the motility of the stomach in both of these conditions, and that no help in diagnosis is possible in this way. It is no doubt for this reason that there is such a want of unanimity among radiologists regarding the particular radiographic features which are diagnostic of hypertrophic pyloric stenosis.—I am, etc.,

London, W.1, Feb. 28. LEONARD FINDLAY.

Excision of the Patella

SIR,—I read with interest in the *Journal* of February 19 two articles on "fractured patella." Mr. G. O. Tippett supports Mr. Brooke in excision, but gives us as a fourth indication "congenitally displacing patella," which Mr. H. Jackson Burrows condemns urgently, and with this condemnation I certainly concur. My experience of Brooke's operation is limited to three cases, but I give them to support his theory.

Twelve years ago a youth of 18 was admitted to one of my beds with a compound comminuted fracture of the left patella, and septic arthritis of the knee-joint had already supervened. Immediate operation, with total excision of contaminated tissues and all patellar fragments and drainage of the joint, led, to my delight, to full function of the joint in four to five weeks.

In April, 1937, a young man of 26 came under my care with a patella refractured within six months of a fibrous union in poor position. I excised his patella and he did equally well.

A month later I was called to a hospital in the district to treat a fractured patella in an old man of 83 with a grossly comminuted patella, which I removed *in toto*. This week, while consulting his doctor on a family surgical emergency, I heard that he now mounts the same ladder in his draper's shop to deliver the hosiery as before.

This, I am sure, speaks well for Brooke's operation, so ably supported by Professor Hey Groves, and I venture to predict it is the operation of the future in selected cases.

I trust that the operation of wiring of the patella is now an anachronism, and that routine cases should be treated by catgut apposition.—I am, etc.,

Oxford, Feb 19. HUGH WHITELOCKE.

SIR,—Mr. G. O. Tippett ends his article on this subject (*Journal*, February 19, p. 383) with the words: "Lastly, we must note Brooke's claim that the power of extension of the knee is better without a patella than with one." If this be so I foresee the likelihood of stretching the crucial ligaments with consequent instability of the knee-joint. The possibility of such an undesirable end-result might well be kept in mind by those contemplating the routine adoption of this seemingly rather drastic measure.—I am, etc.,

Onchan, Isle of Man, Feb. 24. P. W. HAMPTON.

Contraceptives and Fertility

SIR,—As a member of the medical subcommittee of the National Birth Control Association I should like, if I may, to reply to the letters from Mr. V. B. Green-Armytage and Mr. G. H. Alabaster in the *Journal* of February 19 (p. 419). There seems to be some misconception in their minds as to the point which we were attempting to make. Surely everyone who has dealt with cases of sterility—and many such cases come to the birth control clinics—is in agreement with Mr. Green-Armytage and Mr. Alabaster when they stress the importance of cervicitis and abnormal cervical secretions as factors in the production of infertility. We did not wish to raise the moral, social, and obstetrical issues involved in the deliberate postponement of pregnancy, for again we are probably in agreement with your correspondents that there is much to be said on all these counts in favour of early child-bearing. The mere postponement of the first pregnancy, by whatever means, is in itself conducive to sterility, since fertility in the female decreases rapidly with age. The point which we do not consider proven and about which we wish to join issue with Mr. Green-Armytage is his contention that the use of certain contraceptives (caps and acid chemicals) before the first pregnancy increases the incidence of cervicitis. His suggestion that infection of the cervical canal commonly follows the use of a cap is a grave one and has far-reaching implications, yet it is unconvincing. Might not the bacteria introduced during normal coitus be equally culpable? Those of us who draw our patients from rural areas, where the use of chemical and mechanical contraceptives in early married life is still extremely rare, can quote many cases of nulliparous women who are found on examination to have cervical erosions and other evidence of cervicitis. With regard to his point about the upsetting of the physiological *p*H of the vagina, there does not at present appear to be any satisfactory evidence that the introduction of acid substances into the vagina has more than a transient effect, owing to the excellent buffering action of the vaginal and cervical fluids, nor is there evidence that the mere lowering of the vaginal *p*H *per se*, excepting by solutions more strongly acid than those used in contraception, can cause erosion of the cervix and cervicitis. These points are actually being investigated by the committee.

If the things of which Mr. Green-Armytage complains are liable to induce cervical infection and subsequent sterility in nulliparae, then why will they not do so equally in multiparae whose cervices are already more or less damaged? Yet all the evidence accumulated at the birth control clinics, from thousands of cases, indicates that

the use of caps and chemicals has no tendency to induce sterility—often to the embarrassment of the clinic workers—and that not uncommonly cervices which when seen at the first examination were in a highly infected state clear up after the woman has been using a cap and chemicals for some months. Mr. Green-Armytage is the plaintiff in this case and the onus of proof lies on him. Without a control series of observations on nulliparous women who have used no contraceptives, and an estimate of the percentage of newly married couples (fertile and infertile) using contraceptives, he is expressing nothing more than a pious opinion. Information on this point is being collected by that most valuable body the Population Investigation Committee. We are fortunate in having Mr. A. C. Palmer as the chairman of the medical subcommittee of the N.B.C.A. and Mr. L. Carnac Rivett as a member. I may add that this subcommittee is not biased in favour of contraception, but was appointed in an attempt to safeguard the public, to investigate and evaluate contraceptive methods, appliances, and chemicals at present in use. The conclusions of this subcommittee are not merely conjectural but are based on direct clinical observation of thousands of cases and scientifically conducted experimental work. An effort is being made to arrive at the true facts without prejudice. Methods are submitted to controlled clinical trial; rubber appliances and chemical products are subjected to stringent tests for efficiency and harmlessness before they are placed on the list of approved goods. The subcommittee is at present engaged in an investigation of the effect of chemicals on the cervix, and would be extremely grateful for any relevant facts and figures which Mr. Green-Armytage might care to place at its disposal.—I am, etc.,

Crediton, Devon, Feb. 25. MARGARET C. N. JACKSON.

SIR,—My committee ask me to state that they have decided against publishing a detailed reply to Mr. Green-Armytage's statements about contraceptives. His assumptions appear to be too much a matter of opinion to be suitable for discussion in the Press. I am asked to remind your readers that our clinics are open to attendance by any medical practitioners, and that many thousands of case records are available for reference. The National Birth Control Association maintains that the teaching of contraception shoud be a matter essentially for the medical profession; and whilst not doubting that indifferent and harmful methods are sometimes employed by the public, it contends that our controlled methods in no way injure health or fertility. This conclusion is shared by all members of the association, including Lord Horder (president), Dr. C. P. Blacker, Mr. Aleck Bourne, Dr. Geoffrey Bourne, Professor F. J. Browne, Mr. Harold Chapple, Mr. C. Lane-Roberts, Sir Walter Langdon-Brown, Mr. A. C. Palmer, and Mr. L. Carnac Rivett.—I am, etc.,

M. A. PYKE,
Secretary, National Birth Control Association.

69, Eccleston Square, S.W.1.
Feb. 28.

SIR,—It is regrettable that a question relating to the results of birth control in general should degenerate into an attempt to defend the proceedings of any particular society which exists for that proclaimed purpose.

Dr. Joan Malleson (February 26, p. 484) takes the extreme case of a recently married, pregnant woman, maintaining an unemployed husband, to justify the practice of immediate birth control on marriage; but does she really believe that equivalent justification exists in more than a very small fraction of the cases in which immediate birth control is applied? There are grounds for objection to the insidious surrender of our racial strength to the short-sighted sympathies of birth control societies and their like, and to the profit-seeking activities of commercial companies.

The threat of war to an empty Empire and the economic difficulties which must arise during the shrinkage of our population are issues which ought to be realized now. The subject of birth control is one for national review and national policy, since it is nation-wide in prevalence and of Imperial concern. It is time for the control of birth control.—I am, etc.,

London, W.1, Feb. 27. GEORGE H. ALABASTER.

SIR,—Surely it is unscientific to speak of "contraceptive measures" having this or that harmful physiological result without explicitly stating which measures were used and by which type of human subject. In 1923 (*Contraception, its Theory, History, and Practice*) I codified more than sixty physiologically, chemically, and physically different types of contraceptives, of many of which not less than hundreds of commercial brands exist. Many of these doubtless have the bad effects described by Mr. Green-Armytage, but it should not be forgotten that I laid down as the slogan of the pioneer birth control clinic—"Never put in the vagina what you would not put in your own mouth"—and hence the contraceptive measures used at the C.B.C. clinics do *not* have the bad effects attributed to "contraceptive measures," unspecified, by Mr. Green-Armytage.—I am, etc.,

C.B.C. Clinic, 108, Whitfield Street, W.1, Feb. 23. MARIE C. STOPES.

Co-operation

SIR,—It is very encouraging to find from Dr. Hugh Paul's letter in the *Journal* of February 26 (p. 480) that medical officers of health are giving practical consideration to the methods to be adopted if real co-operation is to be secured. Dr. Paul suggests that a consultative committee would be ineffective if summoned to assist the medical officer of health in an epidemic. This would certainly be the case if the committee met only on those unfortunate occasions; such a committee, somewhat overawed at its sudden importance, would be about as useful as the collection of "yes-men" that follow a Hollywood director and hang with bated breath on his dicta.

On the other hand, it must be evident to anyone who has considered the matter that a consultative committee, meeting whenever it was of advantage to have an exchange of views between the practitioners in an area and the public health officers, must be of the greatest value in securing the happy and successful development of the local health services. A committee, having gained in this way experience in times of peace, would find some useful part to play when war was suddenly declared on some local outbreak of disease.

Co-operation will not be secured merely by talking or writing on the subject; a little goodwill on both sides would soon see these local committees established.—I am, etc.,

London, W.10, Feb. 26. HORACE A. NATHAN.

SIR,—Dr. Hugh Paul, in the *Journal* of February 26 (p. 480), suggests that a committee representing the general practitioners of a locality would be of no use in the presence of an actual epidemic of infectious disease. If we take the view, which Dr. Paul appears to hold, that a medical officer of health has nothing to learn from such a committee, then we must agree with Dr. Paul's suggestion. It seems, however, that this view is not accepted

either by Mr. Harold Murphy, K.C., in his report, or by the Minister of Health in his recent letter to the Croydon Corporation. May one not add that most medical officers of health, when faced with such an epidemic, would welcome both the guidance and the support which they could obtain from such a committee?

Moreover, Sir, co-operation is not limited either in time or in direction. In any area there either is a co-operative spirit or there is not. The tragedy of Croydon was due to lack of co-operation and co-ordination not in one direction but in many. Do we want another Croydon? If not, then I suggest that it is the duty of all of us, both medical officers of health and general practitioners, to help to perfect the co-operation which would make another such tragedy impossible.—I am, etc.,

London, S.W.18, Feb. 28. F. GRAY.

*** The letter from the Ministry of Health to the Croydon Corporation will be found at page 530 this week.—ED., *B.M.J.*

Abortion and the Law

SIR,—In the recent discussion on "The Law relating to Abortion" (*Journal*, February 19, p. 408) Mr. Justice Humphreys stated that it was in 1837 that abortion was made a statutory criminal offence. This is not quite accurate. Two Acts of Parliament relating to abortion preceded the 1837 Act.

The first (43 Geo. III c. 58) was passed in 1803. By this Act the attempt to procure abortion on a woman quick with child by means of drugs was punishable by death, whereas if the woman were not quick with child the punishment was transportation or imprisonment, whether the attempt was made by drugs or instruments. There seems to have been a remarkable oversight, for the Act does not make it any crime to attempt to procure abortion on a woman quick with child by means of instruments. The first trial under this Act, known as Lord Ellenborough's Act, took place in 1811. The accused was charged with the administration of savin to a woman for the purpose of procuring abortion. He was acquitted. The next Act was passed in 1828 (9 Geo. IV c. 31). By this Act the offence was still a capital one if the woman were quick with child, but if she were not quick with child the crime was not punishable by death. Many pretty legal arguments took place over the exact meaning of the phrase "quick with child." This Act remedied the omission previously referred to.

Then followed the 1837 Act mentioned by Mr. Justice Humphreys, which altered the law in two important respects. There was now no distinction between women quick with child and women not quick with child, and the offence was no longer punishable with death. Finally the two Acts of 1861 and 1929 define the law on abortion at the present time. This last measure, the Infant Life Preservation Act, 1929, was passed to remedy a curious defect in our law, for while it was criminal to destroy a child by procuring abortion or to kill it directly after birth, Mr. Justice Talbot, in a case before him, held that it was no offence to cause the death of a child during the actual process of birth. The Act makes the procuring of abortion legal under certain circumstances—namely, that it is done to save the life of the mother and that the seventh month of pregnancy has been reached. This still leaves the main question of the legality of therapeutic abortion for preserving the life or health of the mother during the first seven months of pregnancy, or for preserving the health of the mother after seven months (for it is legalized only after seven months, and then only for saving the life, not the health, of the mother), in an undecided state.

The law having defined certain circumstances under which it *is* legal to procure abortion, it may well be argued that, by implication, it may not be done under any other circumstances. Are we as safe from the hand of the law as Mr. Justice Humphreys suggests?—I am, etc.,

Hove, Feb. 20. L. A. PARRY, F.R.C.S.

Oblique Osteotomy for Fracture of Neck of Femur

SIR,—I have read with interest the article by Mr. T. P. McMurray in the *Journal* of February 12 (p. 330), but I feel that some criticism is needed. Mr. McMurray describes the Smith-Petersen operation for the introduction of the Smith-Petersen pin. This is now out of date and has been superseded by other methods, one of the most popular being that of Mr. Ernest W. Hey Groves. I have had experience of this method in approximately one hundred cases. The three criticisms which Mr. McMurray levels at the Smith-Petersen operation can be considered in connexion with the Hey Groves method as follows:

(1) There is no operative shock with the Hey Groves method. The patient's general condition improves immediately the operation has been performed, and it can be carried out on patients up to 85 years of age without the slightest fear of complications. If patients can stand treatment at all they will stand this method. The time taken to operate is very short, and after it has been done several times the operator can manage with one *x*-ray only. (2) I have never seen the pin slip out when walking has been begun. The date for the starting of walking is very important. People with decalcified bones should be kept in bed until there is bony union, although young patients with hard bones, between 15 and 40, can walk the next day. (3) In my experience disintegration of the small proximal fragment occurs only after an open operation when the capsule is opened and the blood supply to the head is further embarrassed. In none of my cases has it happened after operation by the closed method. Henderson's 25 per cent. of aseptic necrosis followed the open operation, using the Smith-Petersen incision.

In those cases in which the pin was correctly placed union took place in every instance. In those cases in which the pin was incorrectly placed—4 per cent.—the pin was removed and either reinserted correctly or else McMurray's osteotomy was performed. In cases of failure McMurray's osteotomy is of great value. In those cases which cannot be treated by the closed method because reduction cannot be obtained—this has occurred only twice in my experience—McMurray's osteotomy is performed. In my opinion the intracapsular fractures of the transcervical type are no longer a problem. It is much easier to produce perfect results in this type of fracture, by means of the Hey Groves technique, than it is in Colles's fracture in aged patients. There have been many discussions on this question of intracapsular fractures of the neck of the femur, and it would perhaps be advisable to leave the matter alone until surgeons have been able to collect sufficient cases to produce useful statistics.

Another argument in favour of blind intracapsular pinning is in regard to hospital beds. It would be impossible to treat these cases at hospital in plaster for three and a half months, and beds would not be available for such a length of time at any of the Bristol hospitals, since these fractures are numerous. In the Hey Groves method the patient can leave the hospital

on the fourteenth day and in some cases need not be in hospital longer than three weeks from the date of admission. Cases can be treated in this way even when they arrive at the hospital with bed-sores, since early ambulatory treatment following the pinning operation allows the bed-sores to heal.—I am, etc.,

KENNETH H. PRIDIE,
Assistant Orthopaedic Surgeon,
Bristol Royal Infirmary.

Fracture Clinic, Bristol Royal Infirmary, Feb. 24.

Ascorbic Acid in Urine

SIR,—In an interesting article by Dr. G. W. T. H. Fleming and Dr. T. E. Burrows (*Journal*, February 12, p. 333) on the relative efficiency of acetic and sulphuric acids for the preservation of the ascorbic acid excreted in urine, the conclusion is reached that because sulphuric acid rapidly destroys any ascorbic acid added to water or urine the use of sulphuric acid for clinical purposes is of very doubtful value. This would appear to be contrary to the findings of several workers who have carried out investigations on vitamin C excretion using sulphuric acid as a preservative and state that little or no loss of vitamin occurs when the urine is kept for twenty-four hours. My own experience has shown that the original reducing power of the urine can be better preserved by the addition of 2 per cent. sulphuric acid than by 5 per cent. acetic acid. In the following table taken from my notes it will be seen that in six experiments with sulphuric acid the amount of titrable substance remained fairly constant over a period of twenty-four hours (the slight increase in some specimens may be due to a gradual darkening produced in concentrated urines by sulphuric acid), whereas there was a marked decrease in this substance with 5 per cent. acetic acid. Each specimen of urine immediately after voiding was divided into two parts; 2 per cent. sulphuric acid was added to one part and 5 per cent. acetic acid to the other. Titration was carried out according to the method of Birch *et al.* (1933) using a microburette.

Specimen of Urine No.	Reducing Substance in mg. per cent.			
	Acetic Acid 5%		Sulphuric Acid 2%	
	After 1 hr.	After 24 hrs.	After 1 hr.	After 24 hrs.
1	3.1	2.0	4.0	4.4
2	3.4	2.1	4.5	4.4
3	3.0	2.0	4.2	4.5
4	2.5	1.9	3.4	4.2
5	1.8	1.2	2.3	2.3
6	2.5	1.4	3.1	3.1

Although it is doubtful whether the reducing substance estimated in urine treated with sulphuric acid is entirely a product of ascorbic acid, it appears reasonable to assume that for general diagnostic purposes the results are sufficiently reliable. There is no doubt, however, that when greater accuracy is desired the urine must be titrated immediately it is passed.—I am, etc.,

FREDERICK T. THORPE.
Wadsley Mental Hospital, Sheffield, Feb. 21.

SIR,—Drs. G. W. T. H. Fleming and T. E. Burrows, in their paper on a possible discrepancy in the estimation of ascorbic acid in urine published in the *Journal* of February 12 (p. 333), raise questions which lie more in the province of the analytical or bio-chemist. There are opinions expressed in the paper, however, which invite a more general criticism.

In an earlier part they state that "some workers appear to be aware of the destruction of ascorbic acid by sulphuric acid," and in the summary that "sulphuric acid has been shown to destroy ascorbic acid." Both statements are misleading in their assumption that sulphuric acid is the "destroyer." It is well known that ascorbic acid is rapidly oxidized in aqueous and in alkaline solutions to substances which do not reduce indophenol. The authors themselves have found that the loss of ascorbic acid in solution in water is 100 per cent. in twenty-four hours. Would they say, in this case, that water was the destructive agent? Surely the process involved is oxidation, aided in some instances by traces of copper in the water or organic fluids acting as a catalyst. Van Eekelen (1934) has found that the indophenol-reducing power of urine is actually increased by boiling with 5 per cent. sulphuric acid in an atmosphere of carbon dioxide for fifteen minutes. Later the efficacy of acetic acid as a preservative of ascorbic acid in urine is questioned, when Drs. Fleming and Burrows say "even with acetic acid there is such a destruction of ascorbic acid that it is quite obvious the results obtained will be of very doubtful value." Much clinical research has been done using this very method. Harris (1935) has already stated that the loss of ascorbic acid from urine, on the addition of 5 per cent. glacial acetic acid, is 20 to 30 per cent. in twelve to fifteen hours, but is of opinion that "this loss is generally of little practical significance." There are other possible channels of excretion—sweat and faeces—of ascorbic acid, which his method does not take into account, and he makes no claim that the urinary output of ascorbic acid is a measure of the total metabolism of vitamin C in the body. An average finding, using Harris's technique, is that a healthy adult excretes 35 mg. of ascorbic acid in the urine in twenty-four hours. In the twenty-four hours following the administration of a test dose of 700 mg. of ascorbic acid this will rise to 450 mg. At the other end of the scale the corresponding figures for an adult with scurvy might well be 5 mg. and 7.5 mg. Let the authors add their own average loss of ascorbic acid in presence of acetic acid (20 per cent.) to the above, and they will see that the results are still of the same comparative order of values. The advantage of the test dose is that it magnifies the relatively small differences seen in the "resting-levels," especially when these are low or subnormal. Thus the 20 per cent. loss of ascorbic acid in urine preserved with acetic acid becomes of less importance.

A recent investigation by Scarborough and Stewart (1937) has shown that acid hydrolysis increases the indophenol-reducing power of urine, and this increase is due to the production of extra ascorbic acid, which is present in the urine partly in a reduced form, partly as dehydroascorbic acid, and as hydrolysable derivatives of these substances. Some degree of hydrolysis on the part of sulphuric acid may possibly explain the differences that Drs. Fleming and Burrows have found between their results with sulphuric acid and those obtained with acetic acid.—I am, etc.,

London, S.E.14, Feb 20. R. HARDY.

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Hyperventilation Attacks

SIR,—The hyperventilation attacks recorded by Drs. Russell Fraser and William Sargant in the *Journal* of February 19 (p. 378) recall to mind the case of a woman of 60 who suffered from "fainting fits" when a child.

Soon after the birth of her own child—she was then 35 years old—she developed attacks of tetany of her hands. When I first saw her four years ago I pointed out that her attacks only came on following hyperventilation, and I produced such an attack by forcing her to overbreathe. After that time the attacks became much less frequent. For the past four months I have prescribed acid. hydrochlor. dil., ʒj t.d.s., and since that date she has had no further attacks, although previously these were occurring at roughly three-weekly intervals. The attacks were associated with emotional upsets. No attempt was made to deal with the emotional difficulties from the psychological side, and I believe suggestion may be ruled out by the failure of previous medicaments.

In view of the inability of Fraser and Sargant to obtain relief by acid administration I thought that this case might be worthy of report.—I am, etc.,

Ilford, Essex, Feb. 20. R. N. C. SMITH.

Bug Destruction

SIR,—The article by Mr. S. A. Ashmore and Mr. A. W. McKenny Hughes on coal-tar naphtha for the destruction of bed-bugs in your issue of January 22 will be of great interest to all those connected with public health work. In a previous article on bed-bug control (*Lancet*, May 1, 1937) I made several criticisms of heavy naphtha. While it is now certain that heavy naphtha can be used with safety by the operator (apart from fire risk) and that it is successful in killing adult bugs and nymphs in exposed positions, attention must be drawn to the fact that it is far less toxic to eggs.

The following table shows the toxicity of heavy naphtha, conforming to the published specifications, to eggs laid by bugs reared at 73° F. in this laboratory. The eggs were exposed in wide glass tubes to the saturated air above heavy naphtha in air-tight desiccators. The number of eggs used for each test was approximately fifty and the temperature of fumigation 73° F. After exposure the eggs were removed and kept at the same temperature for observation.

Exposure Time to Saturated Air	Percentage Hatch	Percentage of Nymphs Alive after 18 Days
Controls	97	90
8½ hours' exposure	96	75
15 " "	38	17
24 " "	0*	0

* Six nymphs died on hatching.

When eggs were exposed to air saturated with heavy naphtha at 55° to 65° F. in a desiccator left in the laboratory a complete kill was not obtained even after twenty-four hours' exposure—a 7 per cent. hatch being obtained.

The conditions of test were undoubtedly in favour of the fumigant, as it would be impossible in practice to maintain such concentrations of vapour in dwelling houses. The concentration of naphtha (vol./vol. with air) which can be obtained at 60° F., according to Ashmore and McKenny Hughes in Table I of their article, is of the order of 0.20 per cent., and this was found by them to be lethal to all bugs exposed for twenty-four hours, and a complete kill was ultimately effected with a concentration of 0.10 per cent., although neither the number of insects used nor the temperature during the test was specified (Table II).

It is stated that the concentrations applied equally to eggs, but it is extremely doubtful if a concentration of 0.20 per cent. at 60° F., as estimated on samples of air taken from premises under gas, would be effective in killing eggs concealed behind wainscoting, since a 7 per cent. hatch was obtained under ideal conditions in a sealed desiccator at approximately this temperature after twenty-four hours' exposure. Even at a concentration of 0.25 per cent., obtained with the delayed-action sprinkler, only a small margin of safety is left, and would probably only be completely successful in killing those eggs laid in unconcealed places.

The fact that naphtha is far more effective against the adults and nymphs than against the eggs is contrasted with the behaviour of hydrogen cyanide, which is slightly more toxic to the latter. The belief that eggs were far more resistant than the other stages to hydrogen cyanide is due to the fact that they are often not so well exposed to the fumigant, being laid in concealed places and sometimes protected by cast skins, etc.

Field tests carried out by me with heavy naphtha in six badly infested houses in St. Pancras during June, 1937, have shown that when used in the amount stated—namely, 1 gallon per 750 cu. ft.—a 20 per cent. hatch was obtained from eggs in open tubes exposed to the full action of the vapour in different rooms for a period of twenty-six hours at a temperature of 65° to 70° F. In fairness it must be stated that the premises were in a very bad condition, but much time had been spent in making them as air-tight as possible. The delayed-action sprinkler was not at that date available, but the walls were festooned with blankets and hessian on to which the majority of the naphtha was sprayed.

Although several dozen bugs were collected from the floors of these houses, having dropped from behind the wall-paper above the skirting-boards during fumigation, only one recovered. However, when wall-fittings such as gas-bracket supports were removed live bugs were found behind. The fact that naphtha sometimes fails to kill bugs in such places suggests that in all cases the premises should be stripped.

One of the chief items of expenditure in bed-bug disinfestation work is the cost of redecorating and repairing premises. In all contact insecticide disinfestation, to be certain of killing all bugs with a single spraying loose wall-paper must be thoroughly stripped and all skirting-boards and picture rails removed or eased away from the walls. If this is unnecessary when using heavy naphtha it is an important point and may outweigh other disadvantages, such as the cost of preparing, sealing, and pre-heating. Although heavy naphtha is relatively cheap the cost of material will be considerable if the full dosage as recommended is to be adhered to—namely, 1 gallon per 750 cu. ft. (500 cu. ft. in furnished houses). In addition, another half-gallon or one gallon is to be sprayed by means of the delayed-action sprinkler on to the cotton screens. The total amount necessary may then become of the order of three to four gallons per room.

The table below gives the disinfestation costs of six unoccupied houses in a terrace in St. Pancras. Each house consisted of three floors and a basement, with a total of eight rooms. The total time spent in the preparation of the premises—removing skirting-boards and some floor boards, stripping wall-paper, etc., sealing premises, and subsequent fumigation—was fifteen working days: 163 gallons of heavy naphtha were used—an average of twenty-seven gallons per house.

	£ s. d.
Cost of naphtha at 2s. per gallon	16 4 0
Materials used for sealing of premises: matchboarding, gummed rolls, etc.	5 8 0
Equipment: pump, gas masks, torches, screening material, etc., 2% of cost	3 6 0
Wages and expenses of three men for 15 working days	30 12 11
Hire of lorry	1 15 0
	£57 5 11

The foregoing figures do not take into account the cost of technical supervision of the work.

There is no doubt that the dilapidated state of the houses was the chief reason for the high cost of their disinfestation, since a considerable time was spent in rendering them relatively gas-tight. Although the cost of naphtha was a considerable item in the expense the labour cost is also very considerable, and it would be of great value to public health authorities to be given detailed costings of actual disinfestations by the naphtha process.

There is no doubt that the heavy naphtha process is a much safer method of disinfestation of vacated properties than hydrogen cyanide. On the other hand, it cannot be applied to occupied dwellings, particularly tenements tenanted by several families. In such cases an efficient contact insecticide, if properly applied by an electric or other suitable sprayer, can be used with complete safety and success. It is, however, important that the insecticide used should not only kill adults and nymphs but should also be highly effective as an ovicide. Practical experience has shown that the process is very economical in time and material, and, above all, thorough disinfestation can undoubtedly be achieved.—I am, etc.,

J. M. HOLBORN, B.Sc., F.R.E.S.

Jeyes's Laboratories, Plaistow, E.13, Feb. 14.

Otitis Externa

SIR,—I read with interest the article on "hot-weather ear" by Flight Lieutenant George Morley in the *Journal* of February 19 (p. 373). During fifteen years of practice in Hong Kong I came across many cases of otitis externa caused by *B. pyocyaneus*, often as a result of bathing in sea water which was contaminated by sewage. I found that treatment with an autogenous vaccine alone, without any local application, cleared up most of these cases. In this condition it is often difficult to introduce a preparation into the ear on account of the extreme swelling, which may completely occlude the meatus.—I am, etc.,

London, W.1, Feb. 22. J. C. MACGOWN.

Correct Footwear

SIR,—I am surprised that none of your recent correspondents has drawn attention to the fact that practically the whole range of deformities and disabilities of the feet seen in adult life, and often present in aggravated form in women patients, are to be discovered on systematic examination of young children's feet. Routine examination in toddlers' clinics of infants from the age of 2 upwards has disclosed conditions which undoubtedly are due to the wearing of incorrect shoes at this age and are not self-correcting but generally escape notice unless looked for, because of the absence of associated discomfort when the feet are still very young and pliant.

School children's feet (examined barefoot) confirm the existence and persistence of these deformities, and the fact of their prevalence, though complaints of pain and weakness continue to be rare during school life. The earliest and commonest premonitory defect is a deflection outwards of the terminal phalanx of the great toe (produced by too short shoes or shoes with a too rounded toe), and the mechanism which subsequently produces ingrowing toe-nail, hammer-toe, overlapping outer toes, hallux valgus, spreading of the anterior arches, and corns or blisters, in the young child, is quite clear to those who look and think the matter out. Valgus heel and flat-foot proper may follow from other defects in the type of shoe used or from a combination of bad shoeing with other conditions.

Appearance and efficiency demand that such a widespread departure from perfect form and functioning should not to be left to take its chance amongst the ills to which we become accustomed in "civilized" life. It is obviously useless to tackle a problem of this kind by concentrating on the adult, and I would heartily support those who say that it can only be put right by providing correct lasts and fittings for the generality of the population by willing co-operation of our own profession with the shoe-producing trade. It is we who have stood by and let deformities develop, not seeking to educate the manufacturers on fundamental points, and it is we—not the vain of either sex—who must bear the responsibility if the conditions causing deformity are allowed to continue. Let us combine and secure for the coming generations "physically fit" feet by applying our scientific knowledge to the care of the feet from babyhood.—I am, etc.,

London, S.W.1, Feb. 22. MARGARET EMSLIE.

Early Diagnosis of Pulmonary Tuberculosis

SIR,—According to Dr. Geoffrey Marshall (*Journal*, December 4, 1937, p. 1103), "When the patient comes to the specialist it is usually because there has been some conclusive symptom, or because an examination of the sputum or an *x*-ray photograph of the chest has established the diagnosis." To the general practitioner and those less conversant with the study of radiology the final words of such a statement might be rather misleading, and I feel sure that what was implied must have been: ". . . some conclusive symptom, or because an examination of the sputum *together with an x-ray examination* of the chest has established the diagnosis." There is no question that an *x*-ray examination is a most essential link in the chain of clinical evidence, but an *x*-ray film can in no way be considered a photograph. If it were so many of our difficulties would be at an end. Dr. Geoffrey Marshall agrees that a lesion found during *x*-ray examination of the chest should immediately indicate the necessity for further investigations to prove the existence of the tubercle bacillus as the causative organism, and that a diagnosis based on radiology alone is, to say the least, most unwise. Yet every radiologist is familiar with the question—"Is it tuberculosis?" I consider that the most significant remark in Dr. Marshall's address is: "The wise physician will view and discuss these appearances with the radiologist; the wise radiologist will leave the responsibility of diagnosis to the physician." To this I would add "and to the pathologist."—I am, etc.,

Sydney, Australia, Jan. 20. D. G. MAITLAND.

Pure English

SIR,—Feeling certain qualms for previous frequent use of the anomalous word "sympathicolytic," I recently took to using what must seem to etymological analysts the more correct form—namely, "sympatholytic." I find that this has been criticized. As the clinician has an interest in the term as well as the physiologist, I hope you will permit me to attempt to justify the use of the shorter word. It is a compound of three Greek words, *σὺν*, *πάθος*, and *λύσις* (anglicized lysis). The French use the word *sympatholytique*. Taking the root "patho-" of the middle word they logically add the suffix at once. Sympathetic in French nomenclature is *sympathique*, and consequently they with more reason than the English might have inserted an *ico* or *iquo* between root and suffix. Where does *ico* come from in the English compound? If necessary to make an insertion let it at least be *etico*.—I am., etc.,

Cork, Feb. 18. D. T. BARRY.

Obituary

A. DOUGLAS BIGLAND, M.D., F.R.C.P.

Physician, Liverpool Royal Infirmary

We regret to announce the death on February 20 of Dr. Douglas Bigland, who had been honorary physician to the Liverpool Royal Infirmary since September, 1934.

Alfred Douglas Bigland, son of the late Alfred Bigland, M.P., was born at Birkenhead in 1887, and from Birkenhead School went to Caius College, Cambridge, taking his B.A. in the Natural Sciences Tripos. He studied medicine at Liverpool, graduating M.B. and Ch.B.Liverp. in 1912, and M.D. soon afterwards. He obtained the M.R.C.P.Lond. in 1919, and was elected F.R.C.P. in 1935. He had been house-physician at the Liverpool Royal Infirmary, and was appointed medical tutor and registrar in 1914, but after the outbreak of war he joined the R.A.M.C. with a temporary commission and served in France, at Suvla Bay, and in Egypt. On returning to civil life in Liverpool Dr. Bigland was appointed lecturer in clinical medicine at the University, and built up a considerable practice. For some years he was honorary physician and medical officer in charge of the neurological department of the David Lewis Northern Hospital, and before his promotion to the senior visiting staff at the Royal Infirmary, caused by the retirement of Dr. J. C. Matthews, he had been honorary physician to out-patients. His other appointments included those of honorary consulting physician to the Lancashire Mental Hospital, Rainhill, and to the Home for Epileptics, Maghull. Dr. Bigland was an active member of the Liverpool Medical Institution and of the Association of Physicians of Great Britain and Ireland, and contributed several papers to the *Lancet* and the *British Medical Journal*. He acted as sectional editor of the Tropical Diseases Bureau, covering the subject of pellagra. In later years he became very interested in asthma, and established a flourishing asthma clinic at the Royal Infirmary.

Dr. Robert Coope writes:

The death of Dr. Douglas Bigland at the age of 51 came after many years of chronic illness. For the past year it was clear to his friends that he was seriously ill, and in the last six months he was largely confined to his house, hoping that he might recover sufficiently to get back to his hospital and consulting practice. In 1923 he became assistant physician to the Liverpool Royal Infirmary, acting as junior colleague first to the late Dr. John Owen and later to Professor John Hay. The rigours of his war service brought on an illness which was ever afterwards to hamper his career, prevent him from developing his full powers, and by its interruptions to his consulting work place him in a position of insecurity and finally cause his death. In 1930 his first wife, Dr. Phoebe Powell Bigland, died after a long illness; shortly after he himself fell ill again, and he had to spend the best part of two years lying on his back. He returned to work again, and in 1934 was elected to a full physicianship at the Royal Infirmary.

He was a most lovable person. *Souffrir passe; avoir souffert ne passe jamais;* his suffering refined and mellowed him to a rare gentleness, and to the end he retained a brave, gay, and lovely spirit. He had learned to enjoy and treasure what he felt were the important things—to do his work to the best of his ability, to earn the gratitude and confidence of his patients, and to possess the respect and friendship of his students and colleagues. He had long made his peace with the limitations which his illness forced upon him; he had a grand courage to go on as long as ever he could and to accept the fact that he could not do all he wished to do. He was a sound clinician, proud to follow in the clinical tradition of his old teacher, Dr. John Hill Abram, whom he often quoted. To him the patient always came first, and he deliberately made time for those little personal touches which made his patients feel that while he was with them his care and thought were entirely for them individually. He was a good teacher, simple and direct. Perhaps he was at his best at his hospital ward rounds, for in spite of his serious sense of responsibility to patients and students he had a great sense of fun, which bubbled up to the delight of patient, nurses, and students alike. But the peals of merriment which at times interrupted the decorum of a formal ward visit brought confidence to the patient and usually rammed home for the student some fundamental piece of clinical knowledge. A little over three years ago he married again, and to his wife and the two daughters of his first marriage goes out the sympathy of his many friends.

DENIS A. SHEAHAN, M.D., M.CH.

Dr. Denis A. Sheahan was born at Drinagh, Buttevant, Co. Cork, in 1861, the eldest son of Timothy Sheahan. He studied medicine at the Queen's College, Cork, and at Dublin, and obtained the degrees M.D., M.Ch. of the Royal University of Ireland in 1884 and the M.A.O. in 1885. He practised for a short time at Oswestry in Shropshire and later in London. In 1888 he was appointed medical officer to Portsmouth Dockyard, and set up in practice for himself in Commercial Road in the city, and by assiduous attention to his professional duties he quickly established a very extensive practice and remained there for nearly forty-five years, retiring in 1931. During the time he was in Portsmouth he was well known throughout the city for his great kindliness to his patients, and to the citizens in general for his uprightness and high sense of honour. He gave very freely of his services, and his zeal for the welfare of his patients and his capacity for taking pains earned for him the esteem of all those who sought his aid and advice. He truly never spared himself, being constantly—both by night as well as by day—at the service of those who needed him. Dr. Sheahan joined the British Medical Association fifty-one years ago, and was an active member of the Portsmouth Division. He represented the Southern Branch of the Association on the Council from 1918 to 1924, and acted as representative in the Representative Body from 1913 to 1924, his work and energy in this capacity being much appreciated by the members of the executive and by his colleagues in the Division. He was medical officer for the prevention of cruelty to children for many years, and in this work he took much interest, his love and his sympathy for little children being a great stimulus in helping him to alleviate the sufferings of the less fortunate among them.

Dr. Sheahan (writes a colleague) had great power as a raconteur; his native wit and readiness in repartee on many occasions caused much amusement to those with whom he came in contact. He was a keen student of Nature, and was frequently to be seen during a few leisure hours on a Sunday afternoon strolling in the country lanes or in the fields. It is perhaps difficult to imagine the pleasure and the ecstasy which he derived from observing the workings of the bee or the butterfly, or the

swallow or the stoat. Indeed one felt of him that he was thus "never less alone than when alone" observing and meditating on the beautiful works of the Creator so wonderfully portrayed. He died at his home in Portsmouth on February 3, and in accordance with his lifelong wish his remains were conveyed to Ireland, and he was buried in the churchyard at Lisgriffin, Buttevant.

We much regret to announce the death of Dr. J. F. WALKER of Southend-on-Sea, who among many activities in the British Medical Association, both local and central, was chairman of the Charities Committee at headquarters for ten years. An obituary notice will appear later.

The Services

THE KEOGH BANNER

Ceremony at R.A.M. College

An interesting ceremony took place in the Library of the Royal Army Medical College on February 18 on the occasion of the unveiling of the Banner and Crest of the Knight Grand Cross of the Order of the Bath which had been bequeathed to the College by the late Sir Alfred Keogh.

The Director-General (Lieutenant-General Sir James Hartigan, K.C.B.) welcomed the assembly to the unveiling by Lady Keogh of the Banner bequeathed by her distinguished husband, which had until recently hung in the Henry VII Chapel in Westminster Abbey. It was particularly appropriate that the Banner should find its resting-place in the College, as it was largely due to the foresight and initiative of Sir Alfred that the College was first established. It was unnecessary to refer in any detail to Sir Alfred Keogh's career, but he would venture to express the opinion that to no other person did the corps owe so much. (Applause.) He was Director-General first, from 1905 to 1910, a time of great activity in the reorganization of the Army. During that period the College was built and opened, and postgraduate teaching was introduced into the Service: the Army School of Hygiene was first established, and the Territorial Army Medical Service was brought into being. His second period of office was during the great war, and it was a fact now recognized by all that both the Army and the nation were fortunate in having at the head of their Medical Services in that period an officer of such outstanding administrative ability. It was fitting, Sir James Hartigan continued, that they should honour a great man, and he would like to assure Lady Keogh that the memory of her most distinguished husband was held in the highest esteem by all ranks of the Royal Army Medical Corps. They rejoiced to think that the new barracks at Aldershot had been named the Keogh Barracks.

Lady Keogh pulled a silken cord revealing the Banner, charged with the late Sir Alfred Keogh's Coat of Arms—Or, a lion rampant, gules, surmounted by his crest, the whole being hermetically sealed in a stout oak frame with plate glass. Lady Keogh after the unveiling said: "Just before my husband died he told me that he wished his banner to go to this mess. I hope that it will remind you and future generations of all he did for his corps. From the time he was made a member of the Reorganization Committee in 1901 he never ceased to use all his energy and the whole force of his character to helping to make the Royal Army Medical Corps into a thoroughly scientific and efficient branch of the Army, and it is only recently, since I have been going through old letters and papers, that I realize what an uphill and arduous task he had—at any rate during his first years at the War Office. He never spoke of his work at home. He never spared himself, and he was completely without personal ambition; *but* he thought no honour too great for the corps of which he was proud and in which he had great faith. Just before he died he said: 'I loved the soldier—he is the best fellow in the world, and I have done my best for him.' He said what had been the leading principle of his life. I wonder if any man could have faced that terrible war if he had not felt certain that if he were wounded or ill he would have all the skill and care that modern medical science could give. I am happy to think that my husband was at the head of that humane and courageous body of men who, as a dear friend of his wrote, alleviated and repaired the damage of war."

The Commandant (Major-General W. P. MacArthur, C.B.) accepted the Banner and Crest on behalf of the Royal Army Medical College and thanked Lady Keogh for unveiling the Banner: "An act which makes the ceremony a memorable occasion to us all."

MENTIONS IN DISPATCHES

The names of Major-General N. H. Hamilton, C.B., C.I.E., C.B.E., D.S.O., I.M.S., Colonel R. E. U. Newman, O.B.E., M.C., late R.A.M.C., Lieutenant-Colonel R. K. Mallam, O.B.E., R.A.M.C., Lieutenant-Colonel P. J. Ryan, M.C., R.A.M.C., Lieutenant-Colonel S. Arnott, R.A.M.C., Major J. D'A. Champney, R.A.M.C., Major T. W. Davidson, R.A.M.C., Colonel A. A. McNeight, I.M.S., Lieutenant-Colonel R. N. Khosla, I.M.S., Captain G. K. Graham, I.M.S., Captain M. M. Mansfield, I.M.S., Captain V. M. Albuquerque, I.M.S., Captain M. G. Leane, I.M.S., Captain R. B. Davis, I.M.S., and Captain T. Kapur, I.M.S., have been brought to notice by His Excellency the Commander-in-Chief in India for distinguished services rendered in connexion with the operations in Waziristan, North-West Frontier of India, January 17 to September 15, 1937.

The names of Major D. G. Sukumar, I.M.S., Captain W. F. Cooper, I.M.S., and Lieutenant P. W. Suraj, I.M.S., have been brought to notice by His Excellency the Commander-in-Chief in India for distinguished services rendered in connexion with the operations in Waziristan, North-West Frontier of India, November 25, 1936, to January 16, 1937.

Universities and Colleges

UNIVERSITY OF OXFORD

Miss Jean Orr-Ewing, B.M., B.Ch., has been appointed to a Tutorship in Natural Science at Lady Margaret Hall.

UNIVERSITY OF LONDON

At a meeting of the Senate held on February 23, Mr. R. S. Pilcher, M.S., F.R.C.S., was appointed as from October 1 to the University Chair of Surgery tenable at University College Hospital Medical School.

The title of Professor Emeritus of Pathology in the University was conferred on Dr. A. E. Boycott, F.R.C.P., F.R.S., formerly Graham Professor of Pathology at University College Hospital Medical School.

Mr. Herbert Lightfoot Eason, M.D., M.S., F.R.C.S., Principal (late Vice-Chancellor) of the University of London, Professor Edward Mapother, M.D., F.R.C.P., F.R.C.S., Medical Superintendent and Professor of Psychiatry, Maudsley Hospital, and Mr. Clifford Sidney White, M.D., F.R.C.P., F.R.C.S., F.C.O.G., Senior Obstetric Surgeon, University College Hospital, were elected to the Fellowship of University College, London.

A special University Lecture in physiology on "Some Remarks on Vestibular Physiology" will be given at University College, Gower Street, W.C., by Dr. A. P. H. A. De Kleijn, professor of rhinology, laryngology, and otology in the University of Amsterdam, on Tuesday, March 15, at 5 p.m. The lecture, which will be delivered in English, has been arranged under a scheme for the exchange of lecturers between England and Holland. It is addressed to students of the University and to others interested in the subject, and will be illustrated with lantern slides. Admission is free, without ticket.

Medical Notes in Parliament

In the House of Lords on March 1 the Blind Persons Bill and the Population Statistics Bill were read the second time. The Poor Law (Amendment) (No. 2) Bill passed through committee, and the National Health Insurance (Amendment) Bill was brought from the Commons and read a first time. On the same day Lord Strabolgi introduced a Bill for the registration of hairdressers and to regulate the practice of hairdressing, and it was read a first time.

The Parliamentary Medical Committee met on March 1, Sir Francis Fremantle in the chair. The committee agreed to ascertain when the Ministry of Health Estimates would be discussed and to discover whether a whole day could be given to a debate on the health aspects of this Vote. The committee also considered an inquiry to learn whether the Minister of Health would institute a financial inquiry into the claim by the dental profession that an extension of dental treatment, especially of adolescents, would repay the Government.

The Conservative Parliamentary Agricultural Committee, meeting at the House of Commons on March 1, discussed the policy of the British Medical Association on milk. The committee thanked the Minister of Agriculture for his statement on the advertisements of the B.M.A. regarding milk pasteurization. According to a statement authorized by the committee, Mr. Morrison had characterized these advertisements as a distortion of the facts. It was stated to the committee that the Association's advertisements still appeared in certain journals and in certain milk shops, and that the Minister should be asked what further corrective measures could be taken. Professor Basil Buxton of the Royal Veterinary College then addressed the committee on the recent outbreak of foot-and-mouth disease. He remarked on its virulent character, and said at one time there seemed a likelihood that the disease might become endemic, with similar disastrous results to those on the Continent. Britain had been spared that calamity. He supported the policy of slaughter.

The second reading of the Increase of Rent and Mortgage Interest (Restrictions) Bill, which proposes to modify the rent restrictions on some classes of houses, was down for second reading in the House of Commons on March 2, and the committee stage of the Housing (Financial Provisions) Bill was set down for the following day.

Health and Medical Services in the West Indies

On February 23 the House of Lords debated the conditions in the West Indian colonies. During the discussion Lord OLIVIER said the infant death rate in Barbadoes was now rather better because infant clinics had been set up and the people fed their children more sensibly. Barbadoes and "all those places" were riddled with infantile paralysis, which was simply a poverty disease. Earl FORTESCUE, replying for the Government, said the main deficiencies in the nutrition of the West Indian labouring classes were in animal proteins and vitamins, and the main reasons were poverty and ignorance. Much could be done by propaganda and instruction in schools to dispel the ignorance.

During the discussion by the House of Commons in Committee of Supply, on February 28, of the Vote on Account for the Civil Estimates Mr. ORMSBY GORE said that the whole organization of the medical department in Trinidad had got to be improved, and improved quickly. It was impossible to allow doctors who were carrying out their duty to the State of insisting on the standards laid down by the State with regard to housing and sanitation to be at the same time in private practice and in receipt of private fees, either from employers or anybody else. He would be accused of forcing D.P.H. men and the like on the Colony, but he was determined to do it. It was essential that the major recommendations of the Commission's report should be carried out.

Dental Health of the Community

On February 23 at the House of Commons the Health and Housing Committee of Conservative Members received a deputation on the dental condition of the people. It was led by Mr. B. E. Astbury, general secretary of the Charity Organization Society, and by Mr. Grant of the National Dental Aid Fund. Mr. ASTBURY said applications to the Charity Organization Society for dental treatment had increased in a few years by 60 per cent., but no public appeal had been practicable. Proper dental care could save much of the £2,000,000 bill for drugs, but the Ministry of Health said no further money was available for such purposes. Mr. Astbury proposed that, as a beginning, there should be a thorough dental inspection before the entry of a boy or girl into employment insurance benefit. He said much social work, such as the maintenance of rheumatism clinics, was made necessary by neglect of teeth. He held that more should be spent from the national health insurance funds on dental fitness, and he pointed out that under the national physical fitness scheme nothing was to be spent on teeth.

Mr. GRANT said three-fourths of the industrial population had dental defects. The Prudential Society said that half the sickness of the industrial population—especially rheumatism, tuberculosis, and cancer—was due to teeth. He wished dental treatment to be continued after school.

Scottish Voluntary Hospitals

On March 1 Mr. ELLIOT, replying to Mr. Kennedy, said he was aware that some of the Scottish voluntary hospitals had financial difficulties, but there was no evidence that the voluntary system as a whole was unable to meet its commitments. The many important and difficult problems involved in the report of the Committee on Health Services, published in 1936, were being carefully examined, but he was not in a position to make a statement. Replying to Mr. Gallacher on the same date Mr. Elliot said no request for financial assistance from the Buckhaven Hospital, Fife, had yet reached him. There was no provision under which he could give assistance towards its maintenance.

Nutrition of the South African Native

Mr. MACDONALD, replying to Mr. Leach on March 1, said he had seen a Press report of the evidence given by Dr. E. H. Cluver, deputy chief health officer of the Union, to the Native Labour Committee in South Africa that three-quarters of the native population was underfed and that tuberculosis was increasing. Active steps were being taken to improve the diet of the natives in the High Commission Territories, such as an extensive scheme in Basutoland to promote the cultivation of vegetables, and in Bechuanaland the expenditure of large sums of money to improve the water supplies and the teaching of the value of green foodstuffs. The question of nutrition in these Territories was being examined by the committee of the Economic Advisory Council appointed to advise on nutritional matters in the Colonial dependencies generally. The position with regard to tuberculosis, which was closely linked with the problem of nutrition, was being carefully watched.

Rehousing of Tuberculous Persons.—Miss WILKINSON, on February 24, asked the Minister of Health to consider making provision in the new Housing Bill for a special subsidy to local authorities for the rehousing of persons suffering from tuberculosis who lived under housing conditions prejudicial to their health. Sir KINGSLEY WOOD answered that under existing Housing Acts local authorities could provide houses for persons suffering from tuberculosis. Any houses so provided obtained the benefit of the existing subsidies. In addition the authorities might grant rebates from rent in suitable cases. He did not consider any special subsidy necessary.

No. 7

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended February 19, 1938.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 125 great towns (i) in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns (ii) in Eire. (e) The 10 principal towns (iii) in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1938					1937 (Corresponding Week)					1929-37 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	41	5	6	5	2	45	11	9	6	—		
Deaths		2	1				5	2				
Diphtheria	1,590	179	261	44	35	1,156	167	234	53	33	1,208	185
Deaths	39	3	8	1	3	35	2	6	3	—		
Dysentery	185	63	71		1	59	8	26		—		
Deaths				—	—				—	—		
Encephalitis lethargica, acute	3	—	—		—	10	—	—		—		
Deaths		—					1					
Enteric (typhoid and paratyphoid) fever	17	3	2	5	1	30	—	8	5	—	30	—
Deaths	2	—	—	—	—	—	—	—	—	—		
Erysipelas			74	5	4			71	10	5		
Deaths		3					4					
Infective enteritis or diarrhoea under 2 years												
Deaths	55	17	5	3	2	39	11	7	4	2		
Measles			1,691		384*			84		1		
Deaths	3‡	5	15	2	22	9	—	1	—	—		
Ophthalmia neonatorum	108	9	35		—	93	6	36		—		
Deaths												
Pneumonia, influenzal§	1,073	94	13	21	10	1,881	86	66	57	2	1,884	190
Deaths (from Influenza)	42	4	2	2	—	423	33	49	37	14		
Pneumonia, primary			247	12				254	10			
Deaths		25		30	21		19		38	9		
Polio-encephalitis, acute	—	—				—	—					
Deaths		—										
Poliomyelitis, acute	6	—	1	1	—	5	—	—		—		
Deaths		—					1					
Puerperal fever	4†	4	11	2	3	46	9	22	2	1		
Deaths		1‡					2‡					
Puerperal pyrexia	162	9	18		—	136	15	24		—		
Deaths												
Relapsing fever	—	—	—		—	—	—	—		—		
Deaths												
Scarlet fever	2,287	147	490	100	78	1,587	184	359	72	42	1,728	242
Deaths	3	—	—	—	—	4	1	—	2	—		
Small-pox	—	—	—		—	—	—	—		—		
Deaths	—	—		—	—	—	—		—	—		
Typhus fever	—	—	—	—	—	—	—	—	—	—		
Deaths				—	—				—	—		
Whooping-cough			42		9			755		14		
Deaths	20	3	1	1	2	43	9	14	6	4		
Deaths (0-1 year)	465	86	65	59	31	445	70	85	38	26		
Infant mortality rate (per 1,000 live births)	78	71				71	58					
Deaths (excluding stillbirths)	5,194	1,020	701	245	193	5,971	972	854	313	188		
Annual death rate (per 1,000 persons living)	12.8	12.8	13.0	16.6	17.1	14.9	12.1	15.9	21.3	18.0		
Live births	6,204	1,156	927	294	226	6,375	1,194	868	382	243		
Annual rate per 1,000 persons living	15.3	14.6	18.9	19.9	20.0	15.9	14.9	17.7	26.0	23.3		
Stillbirths	272	36				268	41					
Rate per 1,000 total births (including stillborn)	42	30				40	33					

(i) 122 great towns in 1937.
(ii) 12 „ „ „ „
(iii) 9 „ „ „ „

* 362 cases in Belfast alone.
† After October 1, 1937, puerperal fever was made notifiable only in the Administrative County of London.

‡ Deaths from puerperal sepsis.
§ Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

EPIDEMIOLOGICAL NOTES

Diphtheria and Scarlet Fever

There has been a decided decline in the incidence of both scarlet fever and diphtheria for all five countries from which returns of notifications are made, with the single exception of scarlet fever in Scotland, where notifications rose from 471 in the previous week to 490 in the week under review. The chief increases were found in Edinburgh, where 43 (33) cases were notified during the week under review, Renfrew county 18 (7), Lanark county 22 (11). The figures in parentheses denote the numbers notified in the previous week. During the week there were in Scotland no deaths from scarlet fever.

Measles

During the week under review deaths in the 125 great towns numbered 31 compared with 40 in the previous week, the principal towns affected being Greater London 6 (7), administrative county of London 5 (6), Liverpool 4 (15), Manchester 3 (6), Bristol 1 (2). The figures in parentheses denote the deaths in the previous week. During the week 1,551 cases were reported from the L.C.C. elementary schools, compared with 1,417 in the previous week. The average daily admissions to the L.C.C. fever hospitals were 61, compared with 53 for the previous week, and the number of measles patients in the L.C.C. fever hospitals on February 25 was 1,361, compared with 1,168 in the previous week. Details of notifications are available for Bermondsey 25, Stepney 34, Shoreditch 2. Particulars of the conditions of notification in the London boroughs where compulsory notification is in force were given on this page in last week's issue.

In Scotland notifications of measles rose from 1,551 to 1,691, while the deaths for the whole country declined from 20 to 15. Increases of notifications of measles were chiefly seen in Glasgow 1,345 (1,245), in Dundee 47 (38), in Paisley 74 (44); while decreases were noticed in Edinburgh 102 (121), Aberdeen 8 (10). The deaths from measles for the week were: in Glasgow 12, Edinburgh 2, and Dundee 1, compared with 17, 2, and 0 respectively in the previous week. In Northern Ireland the number of measles cases notified declined from 617 to 384; the figures for Belfast were 362, compared with 577 in the previous week. There were 20 deaths in Belfast, scattered over the majority of the urban districts. During the week there were 2 deaths from measles in Dublin.

Corrigenda

In the Registrar-General's weekly return No. 7 certain corrections are made of the figures given in the previous week's returns. For the week ended February 12, 1938, the notifications for England and Wales should read: cerebrospinal fever 33, diphtheria 1,872, dysentery 215, encephalitis lethargica 1, enteric fever 71, ophthalmia neonatorum 101, acute primary and influenzal pneumonia 1,129, acute polio-encephalitis 1, acute poliomyelitis 6, puerperal fever 6, puerperal pyrexia 204, relapsing fever 1, scarlet fever 2,426.

The seventeenth meeting of the well-known society entitled Les Journées Médicales de Bruxelles will be held from April 16 to 20 in order that on the last day the members of this congress may be able to join in the celebrated Floralies Gantoises. Besides the usual scientific discussions there will be an international exhibition of science and art with special reference to their applications in the practice of medicine, surgery, pharmacy, and public health. The fee for participation has been fixed at 100 francs, and for ladies 50 francs. The programme includes a banquet, a gala, and an equestrian display; special social events are being arranged for ladies. More detailed information may be obtained from the general secretary of the congress, Dr. René Beckers, Rue Belliard 141, Brussels.

Medical News

The eleventh British Congress of Obstetrics and Gynaecology will be held in Edinburgh on April 4, 5, and 6, 1939. All those desirous of reading papers are asked to communicate at an early date with the senior local secretary, Dr. E. Chalmers Fahmy, 7, Chester Street, Edinburgh, 3.

Lord Horder will deliver an address on "Human Reactions to Noise" at the Royal Sanitary Institute, 90, Buckingham Palace Road, S.W., on Tuesday, March 8, at 5.30 p.m.

Professor John MacMurray will deliver a lecture on "A Philosopher's View of Modern Psychology" at the next meeting of the Medical Society of Individual Psychology at 11, Chandos Street, W., on Thursday, March 10, at 8.15 p.m. Visitors are welcome.

Mr. F. W. Gamble will deliver the Harrison Memorial Lecture on "Facing Realities" before the Pharmaceutical Society of Great Britain, 17, Bloomsbury Square, W.C., on Tuesday, March 8, at 8.30 p.m., and will receive the Harrison Medal which is awarded biennially to commemorate Colonel E. F. Harrison, a distinguished analytical chemist who was appointed Director of Chemical Warfare in 1918. Colonel Harrison conducted, on behalf of the *British Medical Journal*, the analyses of a number of secret remedies, the results of which were published in these columns at intervals from 1904 to 1912. The analyses were later reprinted by the British Medical Association in book form under the titles of *Secret Remedies* (1909) and *More Secret Remedies* (1912). Both volumes have been out of print for some years.

A symposium on "Industrial Disease," arranged by the London Jewish Hospital Medical Society, will take place at the London Jewish Hospital, Stepney Green, E., on Thursday, March 10, and will be opened by Dr. H. B. Morgan, Mr. D. C. Norris, and Mr. J. L. Smyth. The president, Professor Samson Wright, will take the chair. Tea will be served at 3.15 p.m.

An address entitled "The Doctor in the Home" will be given to senior students of the twelve medical schools in London and to those who have qualified in the last two years by Sir Kaye Le Fleming, M.D., Chairman of Council of the British Medical Association, on Tuesday, March 8, at 5.30 p.m., in the Great Hall of B.M.A. House, Tavistock Square, W.C. Tea in the Members' Lounge from 5 to 5.25 p.m. A film illustrating the work of the Association will be exhibited at 5.15 p.m., and after the address there will be a "talkie" film dealing with physical fitness education, a subject to which Sir Kaye will allude.

The next meeting of the German Pharmacological Society will be held in Berlin from April 23 to 28 under the presidency of Professor Flury of Würzburg. The subjects for discussion are local anaesthesia, cancerogenic substances, coffee and caffeine. Further information can be obtained from the Pharmakologisches Institut, Dorotheenstrasse 48, Berlin, N.W.7.

A sessional meeting of the Royal Sanitary Institute will be held at Hereford Town Hall on Friday, March 11, at 5 p.m., when discussions will take place on "Changing Values in Public Health Administration," to be opened by Dr. A. Middleton Brown, and on "Some Problems of Rural Housing," to be opened by Mr. H. F. Long.

A meeting of the Maternity and Child Welfare Group of the Society of Medical Officers of Health will be held at 1, Thornhaugh Street, Russell Square, W.C., on Friday, March 18, at 8.30 p.m., when Dr. J. E. Wilson will read a paper on "How to Breathe." The Fever Hospital Medical Service Group of the Society will meet at 1, Thornhaugh Street, W.C., on Friday, March 25, at 4 p.m., when Dr. V. D. Allison and Dr. R. Cruickshank will open a discussion on "The Spread of Streptococcal Infections as Ascertained by Type Determinations."

The result of the contest for the Scottish Universities seat, which became vacant by the death of Mr. Ramsay MacDonald, was as follows: Sir John Anderson (Nat. Govt.), 14,042 votes; Miss Frances Melville (Ind.), 5,618 votes; Professor Dewar Gibb (Scot. Nat.), 5,246; and Sir Peter Chalmers Mitchell (Ind. Prog.), 3,868 votes. The National Government candidate secured a majority of 8,424 votes over the next candidate, as compared with 7,359 at the last election.

A meeting of the Harveian Society of London will be held at 26, Portland Place, W., on Thursday, March 10, at 8.30 p.m., when Sir Arthur Hurst will deliver the Harveian Lecture on "Physical Basis of 'Biliousness,' 'Wind round the Heart,' and Some Other Popular Maladies."

We are asked to remind readers that the International Congress on Rheumatism and Hydrology will be held at Oxford from March 27 to 30, followed by the International Congress on Rheumatic Diseases at Bath from March 31 to April 3. Details were published in the *Journal* of January 8 (p. 84). All inquiries about the Oxford Congress should be addressed to the General Secretary, 109, Kingsway, London, W.C.2, and regarding the Bath Congress to the Joint Honorary Secretary, Dr. G. D. Kersley, 6, The Circus, Bath.

The British Health Resorts Association will hold a conference at Hastings on Saturday, March 19, when the two subjects for discussion will be "Horticulture and the Health Resort" and "The Place of the Health Resort in Surgery—Pre-operative and Post-operative."

The Medical Students Committee of the National Union of Students, in co-operation with the Medical Office of the International Confederation of Students, is arranging a tour to Sweden for British students from April 16 to 28. The cost is £14 15s., and the last day for registration is March 14. In addition to general sightseeing, students will have the opportunity of visiting leading hospitals and clinics in Gothenburg, Stockholm, and Uppsala. Information may be obtained from the National Union of Students, 3, Endsleigh Street, London, W.C.1.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

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All communications with reference to ADVERTISEMENTS should be addressed to the Advertisement Manager. Orders for copies of the *Journal* and communications with reference to subscriptions should be addressed to the Secretary, B.M.A. House, Tavistock Square, W.C.1.

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QUERIES AND ANSWERS

Treatment of Ascites

Professor RUTHERFORD MORISON, F.R.C.S., writes from St. Boswells-on-Tweed with reference to "Perplexed's" request (February 12, p. 370) for advice concerning a patient with ascites: "It has surprised me that no one has answered his query because his patient, although 70 years of age, is almost certain to be cured by omentopexy." Professor Morison encloses a reprint from the *British Medical Journal* of January 20, 1912, containing his paper on the "Operative Cure of Ascites due to Liver Cirrhosis," read before the Surgical Section of the Royal Society of Medicine. The first paper by Sir David Drummond and Professor Morison in connexion with the subject appeared in the *British Medical Journal* of September 19, 1896.

Dr. W. SUTHERLAND writes: There is in my practice a woman aged 45, with primary carcinoma of the body of the uterus, on whom I have performed paracentesis one hundred and five times. The abdomen is emptied every twelve days, and thirty pints of fluid are removed. As the patient is able to go about her daily duties after tapping it seems that I may carry my score well ino the second century.

Primary Vaccination at the Age of 12

Dr. S. H. DE G. PRITCHARD, in reply to "Chelsea" (February 19, p. 432), writes: In spite of experience of war service, three years' residence in the tropics, and vaccinating candidates for the Navy and such public services as the Post Office, I have not so far come across this particular problem of post-vaccinal encephalitis. I have performed primary vaccination in hundreds of patients over this age, and I have yet to meet any untoward effects. Were I in "Chelsea's" place I should not hesitate to vaccinate my own son. Personally I always use Jenner lymph. With regard to the memorandum by the Ministry of Health, I have always understood that such cases of encephalitis as have arisen have invariably followed vaccination with lymph prepared from some animal other than the calf, and so far I have not seen recorded a single case of this condition following vaccination with calf lymph. I believe that the rabbit is the villain, and as a matter of interest I should like to know if my belief is shared by others.

LETTERS, NOTES, ETC.

"The Evolutionary Theory"

Surgeon Rear-Admiral CHARLES M. BEADNELL (Egham, Surrey) writes: In the *Journal* of February 26 (p. 497) Colonel G. F. Rowcroft states that Haeckel "admitted that many of his illustrations were deliberately faked in order to make them fit the theory (of evolution)." I should like proof of this astounding assertion. It is true that certain intolerant opponents of the theory of evolution accused the great zoologist of having forged his illustrations of foetuses and embryos with the intent of misleading his readers, but it is equally true that the accusation was indignantly refuted, not only by Haeckel himself but by leading biologists of his day, many of whom were disbelievers in the then new theory of evolution. Diagrammatic illustrations never can represent an actuality, but merely help readers towards an understanding of what that actuality is; the venomous charge brought against Haeckel in this respect could with equal logic be levelled against any writer of a scientific work illustrated by diagrams. Haeckel's books popularizing science have sold in thousands, and are still selling, and their author, far from being a "subtle" writer indulging in "numerous fallacies," is a master of the clear exposition of truth. Colonel Rowcroft seems to be somewhat inconsistent when he says that he believes in evolution "in the sense of progress," while denying that man has evolved from a more primitive ancestry. In any case his definition of evolution is not in accord with that of modern science, which regards it as an ever-present flux and reflux between relatively complex and relatively simple states of matter and energy. There can be no progress—that is, no advance towards higher differentiation—in the absence of some antecedent retrogression. Evolution includes both progressive and retrogressive processes; each is a *sine qua non* complementary to the other. In this sense evolution is not a hypothesis, is not even a theory; it is an established fact. Breeders of animals and plants rely on its principles; in transmuting the elements, physicists demonstrate it in their laboratories, while astronomers see it in the vast laboratories of the suns and nebulae. Whether it be within the crust of the earth, beneath the shell of the egg, or inside the mother's womb, the evidence of the truth of evolution is overwhelming.

Corrigendum

In the *Journal* of February 19 we published at page 420 a letter by Captain Kenneth Lindsay on the "Expulsion of Placenta Praevia in Advance of Foetus." In this letter, "on admission to the second hospital at 10 p.m." should have read "on admission to the hospital at 10 p.m."